APPENDIX F

Noise

Memorandum prepared by Torres and Malisos, February 2010

M E M O R A N D U M

To: Alan Ashimine, MS 455

From: Eddie Torres, MS 455
Achilles Malisos, MS 455

Date: February 12, 2010

Subject: Seawater Desalination Project at Huntington Beach - Acoustical Analysis

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RBF previously prepared the noise analysis for the *Seawater Desalination Project at Huntington Beach Environmental Impact Report Recirculated (EIR)*. Project components consist of those previously considered in the *Seawater Desalination Project at Huntington Beach Recirculated EIR*. The current proposal involves orienting a portion of the facility further north on the Huntington Beach Generating Station (HBGS) site, as well as minor trenching/earthwork for an underground pipeline and pump station. The current proposal also includes a Collocated Operation, which would divert seawater intake from the HBGS once-through cooling water system. In contrast, the project also includes a Stand-Alone Operation, where it is assumed that the HBGS discontinues once-through cooling or lowers intake levels below 152 MGD. In this scenario, the proposed project would assume responsibility of the pumping and intake of seawater through HBGS infrastructure. The following analysis reviews the construction and operational noise impacts associated with the revised portion of the project for both the Collocated Operation and the Stand-Alone Operation.

EXISTING SETTING

Noise Scales and Definitions

Sound is described in terms of the loudness (amplitude) of the sound and frequency (pitch) of the sound. The standard unit of measurement of the loudness of sound is the decibel (dB). Since the human ear is not equally sensitive to sound at all frequencies, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity. The A-weighted decibel scale (dBA) performs this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear.

Decibels are based on the logarithmic scale. The logarithmic scale compresses the wide range in sound pressure levels to a more usable range of numbers in a manner similar to the Richter scale used to measure earthquakes. In terms of human response to noise, a sound 10 dBA higher than another is judged to be twice as loud, and 20 dBA higher four times as loud, and so forth. Everyday sounds normally range from 30 dBA (very quiet) to 100 dBA (very loud).

Many methods have been developed for evaluating community noise to account for, among other things:

- The variation of noise levels over time;
- The influence of periodic individual loud events; and
- The community response to changes in the community noise environment.

Numerous methods have been developed to measure sound over a period of time; refer to Table N-1, *Noise Descriptors*.

Table N-1
Noise Descriptors

Term	Definition
Decibel (dB)	The unit for measuring the volume of sound equal to 10 times the logarithm (base 10) of the ratio of the pressure of a measured sound to a reference pressure (20 micropascals).
A-Weighted Decibel (dBA)	A sound measurement scale that adjusts the pressure of individual frequencies according to human sensitivities. The scale accounts for the fact that the region of highest sensitivity for the human ear is between 2,000 and 4,000 cycles per second (hertz).
Equivalent Sound Level (L_{eq})	The sound level containing the same total energy as a time varying signal over a given time period. The L_{eq} is the value that expresses the time averaged total energy of a fluctuating sound level.
Maximum Sound Level (L_{max})	The highest individual sound level (dBA) occurring over a given time period.
Minimum Sound Level (L_{min})	The lowest individual sound level (dBA) occurring over a given time period.
Community Noise Equivalent Level (CNEL)	A rating of community noise exposure to all sources of sound that differentiates between daytime, evening, and nighttime noise exposure. These adjustments are +5 dBA for the evening, 7:00 PM to 10:00 PM, and +10 dBA for the night, 10:00 PM to 7:00 AM
Day/Night Average (L_{dn})	The L_{dn} is a measure of the 24-hour average noise level at a given location. It was adopted by the U.S. Environmental Protection Agency (EPA) for developing criteria for the evaluation of community noise exposure. It is based on a measure of the average noise level over a given time period called the L_{eq}. The L_{dn} is calculated by averaging the L_{eq}'s for each hour of the day at a given location after penalizing the "sleeping hours" (defined as 10:00 PM to 7:00 AM), by 10 dBA to account for the increased sensitivity of people to noises that occur at night.
Exceedance Level (L_n)	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% (L_{01}, L_{10}, L_{50}, L_{90}, respectively) of the time during the measurement period.

Source: Cyril M. Harris, *Handbook of Noise Control*, dated 1979.

Health Effects of Noise

Human response to sound is highly individualized. Annoyance is the most common issue regarding community noise. The percentage of people claiming to be annoyed by noise

generally increases with the environmental sound level. However, many factors also influence people's response to noise. The factors can include the character of the noise, the variability of the sound level, the presence of tones or impulses, and the time of day of the occurrence. Additionally, non-acoustical factors, such as the person's opinion of the noise source, the ability to adapt to the noise, the attitude towards the source and those associated with it, and the predictability of the noise, all influence people's response. As such, response to noise varies widely from one person to another and with any particular noise, individual responses will range from "not annoyed" to "highly annoyed."

When the noise level of an activity rises above 70 dBA, the chance of receiving a complaint is possible, and as the noise level rises, dissatisfaction among the public steadily increases. However, an individual's reaction to a particular noise depends on many factors, such as the source of the sound, its loudness relative to the background noise, and the time of day. The reaction to noise can also be highly subjective; the perceived effect of a particular noise can vary widely among individuals in a community.

The effects of noise are often only transitory, but adverse effects can be cumulative with prolonged or repeated exposure. The effects of noise on the community can be organized into six broad categories:

- Noise-Induced Hearing Loss;
- Interference with Communication;
- Effects of Noise on Sleep;
- Effects on Performance and Behavior;
- Extra-Auditory Health Effects; and
- Annoyance.

Although it often causes discomfort and sometimes pain, noise-induced hearing loss usually takes years to develop. Noise-induced hearing loss can impair the quality of life through a reduction in the ability to hear important sounds and to communicate with family and friends. Hearing loss is one of the most obvious and easily quantified effects of excessive exposure to noise. While the loss may be temporary at first, it could become permanent after continued exposure. When combined with hearing loss associated with aging, the amount of hearing loss directly caused by the environment is difficult to quantify. Although the major cause of noise-induced hearing loss is occupational, substantial damage can be caused by non-occupational sources.

According to the United States Public Health Service, nearly ten million of the estimated 21 million Americans with hearing impairments owe their losses to noise exposure. Noise can mask important sounds and disrupt communication between individuals in a variety of settings. This process can cause anything from a slight irritation to a serious safety hazard, depending on the circumstance. Noise can disrupt face-to-face communication and telephone communication, and the enjoyment of music and television in the home. It can also disrupt effective communication between teachers and pupils in schools, and can cause fatigue and vocal strain in those who need to communicate in spite of the noise.

Interference with communication has proved to be one of the most important components of noise-related annoyance. Noise-induced sleep interference is one of the critical components of community annoyance. Sound level, frequency distribution, duration, repetition, and variability can make it difficult to fall asleep and may cause momentary shifts in the natural sleep pattern,

or level of sleep. It can produce short-term adverse effects on mood changes and job performance, with the possibility of more serious effects on health if it continues over long periods. Noise can cause adverse effects on task performance and behavior at work, and non-occupational and social settings. These effects are the subject of some controversy, since the presence and degree of effects depends on a variety of intervening variables. Most research in this area has focused mainly on occupational settings, where noise levels must be sufficiently high and the task sufficiently complex for effects on performance to occur.

Recent research indicates that more moderate noise levels can produce disruptive after-effects, commonly manifested as a reduced tolerance for frustration, increased anxiety, decreased incidence of "helping" behavior, and increased incidence of "hostile" behavior. Noise has been implicated in the development or exacerbation of a variety of health problems, ranging from hypertension to psychosis. As with other categories, quantifying these effects is difficult due to the amount of variables that need to be considered in each situation. As a biological stressor, noise can influence the entire physiological system. Most effects seem to be transitory, but with continued exposure some effects have been shown to be chronic in laboratory animals.

Annoyance can be viewed as the expression of negative feelings resulting from interference with activities, as well as the disruption of one's peace of mind and the enjoyment of one's environment. Field evaluations of community annoyance are useful for predicting the consequences of planned actions involving highways, airports, road traffic, railroads, or other noise sources. The consequences of noise-induced annoyance are privately held dissatisfaction, publicly expressed complaints to authorities, and potential adverse health effects, as discussed above. In a study conducted by the United States Department of Transportation, the effects of annoyance to the community were quantified. In areas where noise levels were consistently above 60 dBA CNEL, approximately nine percent of the community is highly annoyed. When levels exceed 65 dBA CNEL, that percentage rises to 15 percent. Although evidence for the various effects of noise have differing levels of certainty, it is clear that noise can affect human health. Most of the effects are, to a varying degree, stress related.

Ground-Borne Vibration

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. The peak particle velocity (PPV) or the root mean square (RMS) velocity is usually used to describe vibration amplitudes. PPV is defined as the maximum instantaneous peak or vibration signal, while RMS is defined as the square root of the average of the squared amplitude of the signal. PPV is typically used for evaluating potential building damage, whereas RMS is typically more suitable for evaluating human response. Typically, ground-borne vibration, generated by man-made activities, attenuates rapidly with distance from the source of vibration. Man-made vibration issues are therefore usually confined to short distances (i.e., 500 feet or less) from the source.

Both construction and operation of development projects can generate ground-borne vibration. In general, demolition of structures preceding construction generates the highest vibrations. Construction equipment such as vibratory compactors or rollers, pile drivers, and pavement breakers can generate perceptible vibration during construction activities. Heavy trucks can also generate ground-borne vibrations that vary depending on vehicle type, weight, and pavement conditions.

Sensitive Receptors

Human response to noise varies widely depending on the type of noise, time of day, and sensitivity of the receptor. The effects of noise on humans can range from temporary or permanent hearing loss to mild stress and annoyance due to such things as speech interference and sleep deprivation. Prolonged stress, regardless of the cause, is known to contribute to a variety of health disorders. Noise, or the lack thereof, is a factor in the aesthetic perception of some settings, particularly those with religious or cultural significance. Certain land uses are particularly sensitive to noise, including schools, hospitals, rest homes, long-term medical and mental care facilities, and parks and recreation areas. Residential areas are also considered noise sensitive, especially during the nighttime hours.

Existing sensitive receptors located in the project vicinity include residential, school, and park uses located to the north, east, and west of the project site; refer to Table N-2, *Sensitive Receptors*.

Table N-2
Sensitive Receptors

Type	Name	Distance from Project Site (feet)	Direction from Project Site
Residential	Residential Uses	1,010	North
		1,525	East
		285	West
Schools	Edison High School	2,025	Northeast
	William E Kettler School	2,265	North
	John H. Eader Elementary School	2,895	East
Parks	Edison Community Park	925	North

Source: Google Earth 2009

Ambient Noise Measurements

In order to quantify existing ambient noise levels in the project area, RBF Consulting conducted noise measurements on November 5, 2009; refer to Table N-3, *Noise Measurements*. The noise measurement sites were representative of typical existing noise exposure within and immediately adjacent to the project site; refer to Exhibit 1, *Noise Measurement Locations*. Ten-minute measurements were taken at each site, between 10:00 AM and 12:00 PM. Meteorological conditions were clear skies, warm, with light wind speeds (0 to 5 miles per hour), and low humidity.

Table N-3
Noise Measurements

Site No.	Location	Leq (dBA)	L_{min} (dBA)	L_{max} (dBA)	Peak (dBA)	Time
1	Huntington State Beach, adjacent to the project site	47.1	41.2	57.2	82.8	10:25 AM
2	Rhodesia Drive, adjacent to the project site	50.0	38.5	68.2	88.8	10:48 AM
3	Hatteras Drive and Breton Lane, adjacent to the project site and Edison Community Park	48.4	36.3	62.6	86.1	11:09 AM
4[1]	Biscayne Drive and Newland Street, adjacent to the project site and mobile home park	62.6	45.3	80.3	101.9	11:35 AM

5	Edison Community Park, adjacent to the project site	53.2	43.6	71.2	95.5	11:57 AM

Note:
1 – It should be noted that construction activities (large heavy trucks, equipment, idling, braking, loading, and unloading) in the vicinity of Site 4 resulted in higher noise levels than would normally occur at this location.

Source: RBF Consulting, November 5, 2009.

Source: Eagle Aerial, 2008.
- Project Site Boundaries.
- Minor Trenching/Earthwork

NOT TO SCALE

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SEAWATER DESALINATION PROJECT AT HUNTINGTON BEACH

Noise Measurement Locations

Exhibit 1

Noise monitoring equipment used for the ambient noise survey consisted of a Brüel & Kjær Hand-held Analyzer Type 2250 equipped with a 4189 pre-polarized microphone. The monitoring equipment complies with applicable requirements of the American National Standards Institute for Type I (precision) sound level meters. The results of the field measurements are indicated in Attachment A, *Noise Data*.

REGULATORY SETTING

It is difficult to specify noise levels that are generally acceptable to everyone; what is annoying to one person may be unnoticed by another. Standards may be based on documented complaints in response to documented noise levels, or based on studies of the ability of people to sleep, talk or work under various noise conditions. All such studies, however, recognize that individual responses vary considerably. Standards usually address the needs of most of the general population.

This section summarizes the laws, ordinances, regulations, and standards that are applicable to the project. Regulatory requirements related to environmental noise are typically promulgated at the local level. However, Federal and State agencies provide standards and guidelines to the local jurisdictions.

State of California Guidelines

California Environmental Quality Act

CEQA was enacted in 1970 and requires that all known environmental effects of a project be analyzed, including environmental noise impacts. Under CEQA, a project has a potentially significant impact if the project exposes people to noise levels in excess of standards established in the local general plan or noise ordinance. Additionally, under CEQA, a project has a potentially significant impact if the project creates a substantial increase in the ambient noise levels in the project vicinity above levels existing without the project. If a project has a potentially significant impact, mitigation measures must be considered. If mitigation measures to reduce the impact to less than significant levels are not feasible due to economic, social, environmental, legal or other conditions, the most feasible mitigation measures must be considered.

California Government Code

California Government Code Section 65302(f) mandates that the legislative body of each county and city adopt a noise element as part of their comprehensive general plan. The local noise element must recognize the land use compatibility guidelines established by the State Department of Health Services.

The guidelines rank noise land use compatibility in terms of “normally acceptable”, “conditionally acceptable”, “normally unacceptable”, and “clearly unacceptable” noise levels for various land use types. Single-family homes are “normally acceptable” in exterior noise environments up to 60 CNEL and “conditionally acceptable” up to 70 CNEL. Multiple-family residential uses are “normally acceptable” up to 65 CNEL and “conditionally acceptable” up to 70 CNEL. Schools, libraries, and churches are “normally acceptable” up to 70 CNEL, as are office buildings and business, commercial, and professional uses.

City of Huntington Beach

Title 8, *Health and Safety,* of the City of Huntington Beach *Municipal Code* covers all noise standards. Chapter 8.40, *Noise Control*, of the *Municipal Code* sets forth all noise regulations controlling unnecessary, excessive, and annoying noise and vibration in the City of Huntington Beach. As outlined in Chapter 8.40.050, *Exterior Noise Standards*, of the *Municipal Code* and as indicated in Table N-4, *Huntington Beach Exterior Noise Limits*, maximum exterior noise levels are based on land use districts. The following is taken from the *Municipal Code*:

Section 8.40.050 Exterior noise standards.

(a) The following noise standards, unless otherwise specifically indicated, shall apply to all residential property within a designated noise zone:

Table N-4
Huntington Beach Exterior Noise Standards

Noise Zone	Noise Level	Time Period
1	55 db(A)	7:00 AM – 10:00 PM
	50 db(A)	10:00 PM – 7:00 AM
2	55 db(A)	Anytime
3	60 db(A)	Anytime
4	70 db(A)	Anytime
Noise Zone 1: All residential properties; Noise Zone 2: All professional office and public institutional properties; Noise Zone 3: All commercial properties with the exception of professional office properties; and Noise Zone 4: All industrial properties.		
Source: City of Huntington Beach, *Huntington Beach California Municipal Code*, December 2001.		

(b) In the event the alleged offensive noise consists entirely of impact noise, simple tone noise, speech, music, or any combination thereof, each of the above noise levels shall be reduced by five (5) db(A). (2379-8/79, 2784.8-9/85)

Additionally, the *Municipal Code* includes Table N-5, *Huntington Beach Interior Noise Standards*, and Section 8.40.070 regarding interior noise standards:

8.40.070 Interior noise standards.

(a) The following noise standards, unless otherwise specifically indicated, shall apply to all real property within a designated noise zone:

Table N-5
Huntington Beach Interior Noise Standards

Noise Zone	Noise Level	Time Period
1	55 db(A)	7:00 AM – 10:00 PM
	45 db(A)	10:00 PM – 7:00 AM
2, 3, 4	55 db(A)	Anytime
Source: City of Huntington Beach, *Huntington Beach California Municipal Code*, December 2001.		

(b) In the event the alleged offensive noise consists entirely of impact noise, simple tone noise, speech, music, or any combination thereof, each of the above noise levels shall be reduced by five (5) db(A). (2379-7/79, 2788-9/85)

In addition to interior and exterior noise standards, the City provides exemptions for construction activities in Section 8.40.090, *Special Provisions*:

8.40.090 Special provisions. The following activities shall be exempt from the provisions of this chapter:

(d) Noise sources associated with construction, repair, remodeling, or grading of any real property; provided a permit has been obtained from the City; and provided said activities do not take place between the hours of 8:00 p.m. and 7:00 a.m. on weekdays, including Saturday, or at any time on Sunday or a federal holiday.

IMPACT THRESHOLDS AND SIGNIFICANCE CRITERIA

Appendix G, of the *CEQA Guidelines* contains analysis guidelines related to the assessment of noise impacts. These guidelines have been utilized as thresholds of significance for this analysis. As stated in Appendix G, a project would create a significant environmental impact if it would:

- Expose persons to, or generate, noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Expose persons to or generate excessive ground borne vibration or ground borne noise levels;
- Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;
- Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;
- For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels; and
- For a project within the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels.

IMPACTS AND MITIGATION MEASURES

SHORT-TERM CONSTRUCTION NOISE IMPACTS

- **GRADING AND CONSTRUCTION WITHIN THE AREA WOULD NOT RESULT IN SIGNIFICANT TEMPORARY NOISE IMPACTS TO NEARBY NOISE SENSITIVE RECEIVERS FOLLOWING IMPLEMENTATION OF MITIGATION MEASURES.**

Impact Analysis:

COLLOCATED OPERATION

The project proposes a seawater desalination facility, situated on an unused fuel oil storage tank area at the HBGS. Construction of the proposed project would occur continuously over approximately two years, and would consist of demolition, grading, trenching, paving, and facility construction.

High groundborne noise levels and other miscellaneous noise levels can be created by the operation of heavy-duty trucks, backhoes, bulldozers, excavators, front-end loaders, compactors, graders, and other heavy-duty construction equipment. Table N-6, *Maximum Noise Levels Generated by Construction Equipment,* indicates the anticipated noise levels of construction equipment. The average nose levels presented in Table N-6 are based on the quantity, type, and Acoustical Use Factor for each type of equipment that is anticipated to be used.

Table N-6
Maximum Noise Levels Generated by Construction Equipment

Type of Equipment	Acoustical Use Factor[1] (percent)	L_{max} at 50 Feet (dBA)
Crane	16	81
Dozer	40	82
Excavator	40	81
Grader	40	85
Other Equipment (greater than five horse power)	50	85
Paver	50	77
Roller	20	80
Tractor	40	84
Truck	40	80

Note:
1 – Acoustical use factor (percent): Estimates the fraction of time each piece of construction equipment is operating at full power (i.e., its loudest condition) during a construction operation.

Source: Federal Highway Administration, *Roadway Construction Noise Model (FHWA-HEP-05-054)*, dated January 2006. Refer to Attachment A, *Noise Data*.

In order to estimate the "worst case" construction noise levels that may occur at an existing noise-sensitive receptor, the combined construction equipment noise levels have been calculated for the demolition, grading, trenching, paving, and building phases. The grading phase would include mostly site preparation activities with rough grading followed by fine grading. Construction equipment utilized during this phase would include graders, heavy-duty trucks, tractors, loaders, and a water truck. The building and paving phase would involve building construction and asphalt laydown activities which would utilize graders, backhoes, trucks, pavers, rollers, and a crane.

Operating cycles for construction equipment used during these phases may involve one or two minutes of full power operation followed by three to four minutes at lower power settings. Other primary sources of acoustical disturbance would be random incidents, which would last less

than one minute (such as dropping large pieces of equipment or the hydraulic movement of machinery lifts). These estimations of noise levels take into account the distance to the receptor, attenuation from molecular absorption and anomalous excess attenuation.

For construction noise, a "substantial" noise increase can be defined as interference with activities during the day and night. One indicator that construction noise could interfere with daytime activities would be speech interference. The City provides an exemption for noise associated with construction and grading in Municipal Code Section 8.40.090, *Special Provisions*, provided that activities do not take place between the hours of 8:00 PM and 7:00 AM on weekdays, including Saturday, or at any time on Sunday or a federal holiday. However, for the purposes of this analysis, the Speech Interference Criteria was used to evaluate potential construction noise impacts on nearby sensitive residential receptors, as follows:

- *Speech Interference Criteria*. Speech Interference Level was designed as a simplified substitute for the Articulation Index.[1] It was originally defined as the average of the now obsolete octave-band sound pressure levels in the 600-1200, 1200-2400, and 2400-4800 (Hertz) octaves. At the present time, Speech Interference Level, based upon the octave band levels at the preferred frequencies of 500, 1000, 2000, and 4000 Hz, is considered to provide a better estimate of the masking ability of a noise. As Speech Interference Level does not take the actual speech level into account, the associated masking effect depends upon vocal effort and speaker-to-listener distance. Speech spoken with slightly more vocal effort can be understood well, when the noise level is 65 dBA. A typical building can reduce noise levels by 20 dBA with the windows closed.[2] This noise reduction could be maintained only on a temporary basis in some cases, since it assumes windows would remain closed at all times. Therefore, this analysis utilizes an interior level of 65 dBA as a criterion level for determining significance for construction related activities in order to evaluate construction noise related impacts on nearby sensitive receptors.

The anticipated short-term construction noise levels generated during demolition, grading, trenching, paving, and building activities are presented in Table N-7, *Construction Average L_{eq} (dBA) Noise Levels by Receptor Distance and Construction Phase*. Construction activities would expose adjacent receptors to interior noise levels of:

- 35.9 dBA to 54.5 dBA during the demolition phase;
- 33.7 dBA to 49.9 dBA during the grading phase;
- 34.3 dBA to 49.9 dBA during the trenching phase;
- 38.3 dBA to 54.4 dBA during paving phase; and
- 36.7 dBA to 48.9 dBA during building construction phase.

Thus, construction noise associated with the proposed project would not expose surrounding sensitive receptors to noise levels in excess of the *Speech Interference Criteria* (65 dBA) during construction.

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1 Articulation index takes into account that some frequencies are more effective in masking speech than others. The frequency range from 250 to 7000 Hertz is divided into 20 bands. The difference between file average speech peak levels in each of these bands is calculated and the resulting numbers combined to give a single index.

2 United States Department of Housing and Urban Development, *The Noise Guidebook*, undated, page 14.

Table N-7
Construction Average L_{eq} (dBA) Noise Levels by Receptor Distance and Construction Phase

Description	Receptor Locations		Estimated Exterior Construction Noise Level[2,3] (dBA)	Estimated Interior Construction Noise Level[2,3] (dBA)	Speech Interference Criteria	Exceed Criteria?
	Direction	Distance[1] (feet)				
Phase 1						
Demolition	North	925	64.2 Lmax 60.3 Leq	44.2 Lmax 40.3 Leq	65 dBA	***No***
	East	1,525	59.9 Lmax 55.9 Leq	39.9 Lmax 35.9 Leq	65 dBA	***No***
	West	285	74.5 Lmax 70.5 Leq	54.5 Lmax 50.5 Leq	65 dBA	***No***
Phase 2						
Rough Grading	North	925	59.7 Lmax 58.1 Leq	39.7 Lmax 38.1 Leq	65 dBA	***No***
	East	1,525	55.3 Lmax 53.7 Leq	35.3 Lmax 33.7 Leq	65 dBA	***No***
	West	285	69.9 Lmax 68.2 Leq	49.9 Lmax 48.2 Leq	65 dBA	***No***
Phase 3						
Fine Grading	North	925	59.7 Lmax 58.1 Leq	39.7 Lmax 38.1 Leq	65 dBA	***No***
	East	1,525	55.3 Lmax 53.7 Leq	35.3 Lmax 33.7 Leq	65 dBA	***No***
	West	285	69.9 Lmax 68.2 Leq	49.9 Lmax 48.2 Leq	65 dBA	***No***
Phase 4						
Trenching	North	925	59.7 Lmax 58.7 Leq	39.7 Lmax 38.7 Leq	65 dBA	***No***
	East	1,525	55.3 Lmax 54.3 Leq	35.3 Lmax 34.3 Leq	65 dBA	***No***
	West	285	69.9 Lmax 68.9 Leq	49.9 Lmax 48.9 Leq	65 dBA	***No***
Phase 5						
Paving	North	925	64.2 Lmax 62.6 Leq	44.2 Lmax 42.6 Leq	65 dBA	***No***
	East	1,525	59.8 Lmax 58.3 Leq	39.8 Lmax 38.3 Leq	65 dBA	***No***
	West	285	74.4 Lmax 72.8 Leq	54.4 Lmax 52.8 Leq	65 dBA	***No***
Phase 6						
Facility Construction	North	925	59.7 Lmax 61.0 Leq	39.7 Lmax 41.0 Leq	65 dBA	***No***
	East	1,525	55.3 Lmax 56.7 Leq	35.3 Lmax 36.7 Leq	65 dBA	***No***
	West	285	68.9 Lmax 66.0 Leq	48.9 Lmax 46.0 Leq	65 dBA	***No***

Notes:
1 – Distance is from the nearest sensitive receptor to the closest construction activity area of the project site.
2 – Derived from the Federal Highway Administration, *Roadway Construction Noise Model (FHWA-HEP-05-054),* dated January 2006. Refer to Attachment A, *Noise Data*.
3 – A typical building can reduce noise levels by 20 dBA with the windows closed.[3] This assumes all windows and doors are closed, thereby attenuating the exterior noise levels by 20 dBA.

[3] United States Department of Housing and Urban Development, *The Noise Guidebook*, undated, page 14.

Noise sensitive receptors in proximity to the construction site (i.e., residential, school, and park uses) would not experience excessive noise levels during construction activities. Construction noise impacts are short-term and would cease upon completion of construction. Also, the City provides exemptions for construction activities from the provisions of the Noise Ordinance in Section 8.40.090, *Special Provisions*, provided that they take place between the hours of 7:00 AM and 8:00 PM weekdays and Saturdays. Implementation of Mitigation Measure N-1 would further minimize any impacts from construction noise and would ensure that impacts are less than significant. Thus, a less than significant impact would result from construction activities.

Construction activities would also cause increased noise along access routes to and from the site due to movement of equipment and workers. The proposed project would require the export of 73,000 cubic yards of soil from the project site. Construction worker commute trips would be a maximum of approximately 225 trips per day. All construction traffic would utilize Newland Street to access the project site. Construction traffic traveling north along Newland Street would cause increased noise levels to surrounding residents during the construction period. Traffic traveling south along Newland Street would cause minimal disturbance, as residents do not directly front Newland Street to the south of the project site. Newland Street has a street capacity of 20,000, as identified in the City of Huntington Beach General Plan Circulation Element. Also, a portion of Newland Street near the project site is a designated truck route, according to the General Plan. Therefore, surrounding uses along Newland Street would not notice an increase in traffic noise from construction trips due to the existing high volume of traffic and trucks traveling along Newland Street. Also, construction activities would take place during allowable daytime hours (7:00 AM to 8:00 PM), would be short-term, and would cease upon project completion. Therefore, noise impacts from construction traffic would be less than significant.

Adherence to Chapter 8.40, *Noise Control*, of the *Municipal Code* requirements would ensure short-term construction noise impacts would be less than significant. The proposed project construction is anticipated to occur over a period of approximately two years and sensitive receptors would not be exposed to significant construction noise levels over an extended period of time. Construction noise impacts would cease upon completion of the construction phase. Impacts would be less than significant.

STAND-ALONE OPERATION

Under the Stand-Alone Operation, the proposed project would assume responsibility for the intake of raw seawater through HBGS infrastructure. This scenario assumes that HBGS abandons once-through cooling operations or minimizes its intake to below 152 MGD (the minimum necessary for desalination operations). However, all construction activities would be identical to what is required for the Collocated Operation. The only difference would be that the Stand-Alone Operation would require the replacement of one of the existing HBGS once-through cooling pumps. The installation of the additional intake pump would not change the noise impacts that were analyzed in the Collocated Operation. As a result, construction activities would be the same as what would occur for the Collocated Operation. Therefore, construction noise impacts would be less than significant with the implementation of Mitigation Measure N-1.

Mitigation Measures:

N-1 Prior to Grading Permit issuance, the project shall demonstrate, to the satisfaction of the City that the project complies with the following:

- Construction contracts specify that all construction equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers and other state required noise attenuation devices.
- Property owners and occupants located within 1,200 feet of the project boundary shall be sent a notice, at least 15 days prior to commencement of construction of each phase, regarding the construction schedule of the proposed project. A sign, legible at a distance of 50 feet shall also be posted at the project construction site. All notices and signs shall be reviewed and approved by the City, prior to mailing or posting and shall indicate the dates and duration of construction activities, as well as provide a contact name and a telephone number where residents can inquire about the construction process and register complaints.
- Prior to issuance of each Grading or Building Permit, the Applicant shall demonstrate to the satisfaction of the City's Building Official how construction noise reduction methods (i.e., shutting off idling equipment, installing temporary acoustic barriers around stationary construction noise sources, and maximizing the distance between construction equipment staging areas and occupied residential areas) shall be used where feasible.
- Construction haul routes shall be designed to avoid noise sensitive uses (e.g., residences, schools, etc.).
- During construction, stationary construction equipment shall be placed such that emitted noise is directed away from sensitive noise receivers.

CONSTRUCTION-RELATED VIBRATION IMPACTS

- **GRADING AND CONSTRUCTION ASSOCIATED WITH THE PROPOSED PROJECT WOULD NOT RESULT IN SIGNIFICANT TEMPORARY VIBRATION IMPACTS TO NEARBY RECEPTORS.**

Impact Analysis:

COLLOCATED OPERATION

Persons residing and working in the area surrounding the project could be exposed to the generation of excessive groundborne vibration or groundborne noise levels related to construction activities. Site ground vibrations from construction activities very rarely reach the levels that can damage structures, but they can achieve the audible range and be felt in buildings very close to the site. The primary and most intensive vibration source associated with the development of the project would be the use of heavy equipment during grading activities. These types of equipment can create intense noise that is disturbing and can result in ground vibrations. Section 8.40.090, *Special Provisions*, of the Municipal Code includes an exemption for noise associated with construction and grading in Municipal Code Section 8.40.090. However, the Municipal Code does not specifically include an exemption for vibration associated with construction activities.

The results from vibration can range from no perceptible effects at the lowest vibration levels, to low rumbling sounds and perceptible vibrations at moderate levels, to slight structural damage at the highest levels. Ground vibrations from construction activities rarely reach the levels that can damage structures, but they can achieve the audible and perceptible ranges in buildings

close to the construction site. Table N-9, *Typical Vibration Levels for Construction Equipment*, lists vibration source levels for construction equipment.

Table N-8
Typical Vibration Levels for Construction Equipment

Equipment	Approximate VdB			
	25 Feet	50 Feet	75 Feet	100 Feet
Large Bulldozer	87	81	77	75
Loaded Trucks	86	80	76	74
Small Bulldozer	58	52	48	46
Source: Federal Railroad Administration, 2005.				

Sensitive land uses surrounding the project site to the north, east, and west consist of residential and park uses. As indicated in Table N-8, large bulldozers are capable of producing approximately 75 VdB at 100 feet. As the nearest sensitive residential receptor to construction activities associated with the on-site desalination facility would be located 285 feet to the west, ground vibrations from project construction activities would not exceed the FRA groundborne vibration threshold of 72 VdB for residential land uses. Additionally, structures directly surrounding the project site (at a distance of 80 feet) consist of industrial buildings. These industrial buildings are expected to be structurally sufficient to withstand potential vibration from construction activities. Consequently, vibration impacts are considered less than significant.

STAND-ALONE OPERATION

Under the Stand-Alone Operation, all construction activities would be the same as what is required for the Collocated Operation because the site layouts would be the same. The Stand-Alone Operation would require the replacement of one existing HBGS intake pump. However, activities associated with installation of this pump would occur within the boundaries of the project site. As with the Collocation Operation, the nearest sensitive residential receptor to construction activities associated with the on-site desalination facility would be located 285 feet to the west. At this distance, ground vibrations from project construction activities would not exceed the FRA groundborne vibration threshold of 72 VdB for residential land uses. Therefore, construction-related vibration impacts associated with the Stand-Alone Operation would be less than significant.

Mitigation Measures: No mitigation measures are required.

LONG-TERM OPERATIONAL NOISE IMPACTS

- **OPERATIONS OF THE DESALINATION FACILITY WOULD NOT RESULT IN SIGNIFICANT NOISE IMPACTS TO NEARBY NOISE SENSITIVE RECEIVERS, FOLLOWING IMPLEMENTATION OF MITIGATION MEASURES.**

Impact Analysis:

COLLOCATED OPERATION

The proposed project would include long-term on-site stationary noise sources. The primary operational components that would emit noise are the pumps associated with the intake,

reverse osmosis system, membrane cleaning system, and the product water pumps. Table N-9, *Stationary Noise Sources*, provides the pumps necessary for the proposed project and their horsepower and associated sound level. As indicated in Table N-9, the loudest pumps would be the reverse osmosis feed pumps and product water pumps, which would be located indoors and within an underground vault, respectively.

Table N-9
Stationary Noise Sources

Unit	Number of Units (Number of Standby Units)	Horse Power	Combined Sound Level (dBA)[1]
Indoor Pumps			
High Pressure RO Feed Pumps and ERS	3 (1)	7,500	108
Circulation Pumps	10 (0)	350	103
Product Water Pumps 25 MGD (vault)	2 (1)	5,000	108
Product Water Pumps 4 MGD (vault)	1 (0)	750	103
Membrane Cleaning Pumps (intermittent)	1 (0)	500	100
Flush Pumps (intermittent)	1 (1)	450	100
Outdoor Pumps			
Seawater Intake Pumps	2 (1)	800	103
Filter Effluent Transfer Pumps to HP	3 (1)	2,250	106
Filter Effluent Transfer Pumps to ERS	2 (1)	1,400	104
RO = Reverse Osmosis; ERS = Energy Recovery System; MGD = million gallons per day; HP = High Pressure			
Notes: 1. Beranek and Ver, *Noise and Vibration Control Engineering*, 1992.			

Table N-10, *Noise Levels at Nearby Receptors*, provides the noise levels resulting from pump operations at four separate locations within the project site. The noise levels at the nearest sensitive receptors from each of these locations have been provided in Table N-10. The calculated noise levels in Table N-10 take into account the distance from the source to the receiver and whether the pumps are enclosed within a building/vault or outdoors. As indicated in Table N-10, the product water pumps would be located 350 feet away from the nearest sensitive receptors. However, these pumps would be located within an underground vault, which would provide attenuation. The seawater intake pumps would be the next closest to sensitive receptors, which are 700 feet west of the influent pump station. This pump station would not be located within an enclosure that would attenuate noise.

Table N-10
Noise Levels at Nearby Receptors

Unit	Distance to Nearest Receptor[1]		Attenuation from Enclosures (dBA)[2]	Noise Level at Receptor (dBA)[3]
INDOOR PUMPS				
RO Process Building				
▪ High Pressure RO Feed Pumps and ERS	North	1,020	20	39.5
▪ Circulation Pumps	East	1,000	20	39.6
▪ Membrane Cleaning Pumps ▪ Flush Pumps	West	1,533	20	35.9

Table N-10 (continued)
Noise Levels at Nearby Receptors

Unit	Distance to Nearest Receptor[1]		Attenuation from Enclosures (dBA)[2]	Noise Level at Receptor (dBA)[3]
Vault				
▪ Product Water Pumps 25 MGD ▪ Product Water Pumps 4 MGD	North	1180	20	37.9
	East	2,500	20	47.9
	West	350	20	30.8
OUTDOOR PUMPS				
Next to Treatment Structure				
▪ Filter Effluent Transfer Pumps to HP ▪ Filter Effluent Transfer Pumps to ERS	North	1,400	N/A	54.7
	East	1,545	N/A	53.9
	West	1,030	N/A	57.4
Influent Pump Station				
▪ Seawater Intake Pumps	North	1,860	N/A	47.2
	East	2,250	N/A	45.5
	West	700	N/A	55.6

RO = Reverse Osmosis; ERS = Energy Recovery System; MGD = million gallons per day; HP = High Pressure; N/A = not applicable.

Notes:
1. There are no sensitive receptors located to the south of the project site.
2. Attenuation from enclosures is based on ANSI S1.31, *Precision Methods for the Determination of Sound Power Levels of Broadband Noise Sources in Reverberation Rooms*.
3. Calculated using the Inverse Square Law of Noise Propagation.

Table N-11, *Combined Noise Levels at the Nearest Sensitive Receptors*, presents the combined noise levels from all pumps at the closest sensitive receptors in each direction from the project site. It should be noted that there are no receptors to the south of the project site. As depicted in Table N-11, sensitive receptors located to the west would experience noise levels of 59.9 dBA. When accounting for existing intervening structures (industrial buildings to the north), berms, and tanks (to the west), the anticipated noise levels would be further reduced. Additionally, as depicted in Table N-3, background noise levels in the project area would be below the combined noise levels in Table N-11. As previously indicated in Table N-4, the City's applicable exterior noise standards are 55 dBA between 7:00 AM and 10:00 PM, and 50 dBA between 10:00 PM and 7:00 AM. Therefore, pump noise levels would be potentially significant. As a result, implementation of Mitigation Measure N-2 would reduce this impact by requiring the outdoor pump stations to be located within an enclosure designed to reduce noise levels by at least 20 dBA. As depicted in Table N-11, the implementation of Mitigation Measure N-2 would reduce impacts to a less than significant level.

Table N-11
Combined Noise Levels at the Nearest Sensitive Receptors

Receptor Location	Combined Noise Level	Combined Noise Level With Mitigation
North	55.6	43.4
East	54.6	42.1
West	59.9	48.7

Note: Combined noise levels are based on noise levels calculated in Table N-10, above.

STAND-ALONE OPERATION

Under the Stand-Alone Operation, the primary operational components that would emit noise are the intake pump station, the reverse osmosis system, the membrane cleaning system, and the product water pump station. The Stand-Alone Operation would also assume responsibility for the operation of two existing HBGS once-through cooling pumps, and the replacement of one existing HBGS pump (for a total of three additional duty pumps in comparison to the Collocated Operation). These three additional pumps would be located near the proposed influent pump station that would divert water to the desalination plant from HBGS once-through cooling infrastructure.

Table N-12, *Noise Levels at Nearby Receptors*, provides the noise levels associated with the Stand-Alone Operation resulting from pump operations at four separate locations within the project site. The calculated noise levels in Table N-12 take into account the distance from the source to the receiver and whether the pumps are enclosed within a building/vault or outdoors. The seawater intake pumps would be the next closest to sensitive receptors, which are 700 feet west of the influent pump station. This pump station would not be located within an enclosure that would attenuate noise.

Table N-12
Noise Levels at Nearby Receptors

Unit	Distance to Nearest Receptor[1]		Attenuation from Enclosures (dBA)[2]	Noise Level at Receptor (dBA)[3]
INDOOR PUMPS				
RO Process Building				
▪ High Pressure RO Feed Pumps and ERS ▪ Circulation Pumps ▪ Membrane Cleaning Pumps ▪ Flush Pumps	North	1,020	20	39.5
	East	1,000	20	39.6
	West	1,533	20	35.9
Vault				
▪ Product Water Pumps 25 MGD ▪ Product Water Pumps 4 MGD	North	1180	20	37.9
	East	2,500	20	47.9
	West	350	20	30.8
OUTDOOR PUMPS				
Next to Treatment Structure				
▪ Filter Effluent Transfer Pumps to HP ▪ Filter Effluent Transfer Pumps to ERS	North	1,400	N/A	54.7
	East	1,545	N/A	53.9
	West	1,030	N/A	57.4
Influent Pump Station/HBGS Pumps				
▪ Seawater Intake Pumps	North	1,860	N/A	50.2
	East	2,250	N/A	48.5
	West	700	N/A	58.6

RO = Reverse Osmosis; ERS = Energy Recovery System; MGD = million gallons per day; HP = High Pressure; N/A = not applicable.

Notes:
1. There are no sensitive receptors located to the south of the project site.
2. Attenuation from enclosures is based on ANSI S1.31, *Precision Methods for the Determination of Sound Power Levels of Broadband Noise Sources in Reverberation Rooms*.
3. Calculated using the Inverse Square Law of Noise Propagation.

Table N-13, *Combined Noise Levels at the Nearest Sensitive Receptors*, presents the combined noise levels from all pumps at the closest sensitive receptors in each direction from the project site. It should be noted that there are no receptors to the south of the project site. As depicted in Table N-13, sensitive receptors located to the west would experience noise levels of 61.3 dBA. When accounting for existing intervening structures (industrial buildings to the north), berms, and tanks (to the west), the anticipated noise levels would be further reduced. Additionally, as depicted in Table N-3, background noise levels in the project area would be below the combined noise levels in Table N-13. As previously indicated in Table N-4, the City's applicable exterior noise standards are 55 dBA between 7:00 AM and 10:00 PM, and 50 dBA between 10:00 PM and 7:00 AM. Therefore, pump noise levels would be potentially significant. As a result, implementation of Mitigation Measure N-2 would reduce this impact by requiring the outdoor pump stations to be located within an enclosure designed to reduce noise levels by at least 20 dBA. As depicted in Table N-13, the implementation of Mitigation Measure N-2 would reduce impacts to a less than significant level.

Table N-13
Combined Noise Levels at the Nearest Sensitive Receptors

Receptor Location	Combined Noise Level	Combined Noise Level With Mitigation
North	56.2	42.8
East	55.1	43.0
West	61.3	48.9
Note: Combined noise levels are based on noise levels calculated in Table N-10, above.		

Mitigation Measures:

N-2 All pumps located outdoors (i.e., seawater intake pumps, filter effluent transfer pumps, and stand alone pumps) shall be located within enclosed structures with adequate setback and screening, as necessary, to achieve acceptable noise levels at the property lines of nearby residences in accordance with City's Noise Ordinance Once the stationary noise sources have been installed, noise levels shall be monitored to ensure compliance with the City's Noise Ordinance. If stationary noise sources exceed levels specified in the City's Noise Ordinance, an acoustical engineer shall be retained by the project Applicant to install additional noise attenuation measures in order to meet the applicable noise standard.

AIRPORT RELATED IMPACTS

- **THE PROPOSED PROJECT IS NOT LOCATED WITIN TWO MILES OF A PUBLIC OR PRIVATE AIRPORT AND WOULD NOT EXPOSE PEOPLE TO EXCESSIVE NOISE LEVELS.**

Impact Analysis:

COLLOCATED OPERATION

The project site is not located within an airport land use plan and not within two miles of a public airport or public- or private-use airstrip. The nearest airport to the project site is John Wayne International Airport, located approximately six miles northeast of the project site.

Implementation of the proposed project would not expose people residing or working in the project area to excessive noise levels. Therefore, no impact would occur in this regard.

STAND-ALONE OPERATION

The Stand-Alone Operation would be located at the same project site as the Collocated Operation. Therefore, as with the Collocated Operation, the Stand-Alone operation would not expose people in the project area to excessive noise levels. No impact would occur in this regard.

Mitigation Measures: No mitigation measures are required.

SIGNIFICANT UNAVOIDABLE IMPACTS

No significant and unavoidable impacts have been identified.

Attachments:

A. Noise Data

Attachment A: Noise Data

Site Number: #1 (HB # 001)
Recorded By: Brian Allee
Job Number: 15102152
Date: 11/05/2009
Time: 10:25 AM
Location: Huntington State Beach, adjacent to project site.
GPS:
Source of Peak Noise: Vehicular noise from Pacific Coast Highway and State Beach parking lot – Pedestrians walking/jogging/biking/talking along boardwalk – Construction across Pacific Coast Highway – Plant noise – Waves crashing – Birds chirping.

Noise Data			
Leq (dB)	**Lmin (dB)**	**Lmax (dB)**	**Peak (dB)**
47.1	41.2	57.2	82.8

Equipment						
Category	**Type**	**Vendor**	**Model**	**Serial No.**	**Cert. Date**	**Note**
Sound	Sound Level Meter	**Brüel & Kjær**	**2250**	**2548189**	**9/10/2009**	
	Microphone	**Brüel & Kjær**	**4189**	**2543364**	**9/10/2009**	
	Preamp	**Brüel & Kjær**	**ZC 0032**	**4265**	**9/10/2009**	
	Calibrator	**Brüel & Kjær**	**4231**	**2545667**	**9/10/2009**	

Weather Data			
Est.	**Duration:** 10 minutes		**Sky:** ☼
	Note: dBA Offset = -0.02		**Sensor Height (ft):** 5 ft
	Wind Ave Speed (mph / m/s)	**Temperature (degrees Fahrenheit)**	**Barometer Pressure (hPa)**
	4.1	68.5	1019.5

Photo of Measurement Location

2250

Instrument:		2250
Application:		BZ7225 Version 2.0.2
Start Time:		11/05/2009 11:24:54
End Time:		11/05/2009 11:34:54
Elapsed Time:		00:10:00
Bandwidth:		1/3-octave
Max Input Level:		140.16

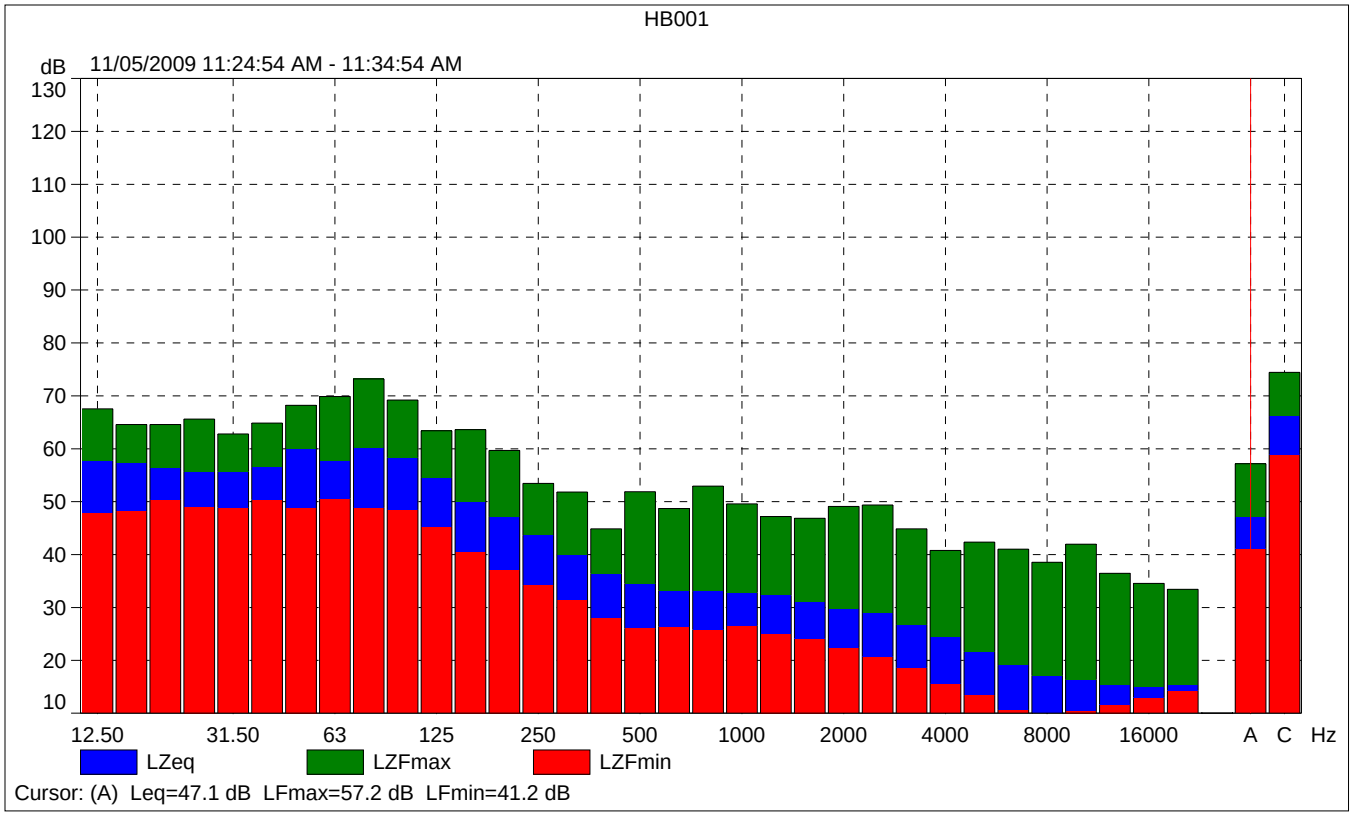
	Time	Frequency
Broadband (excl. Peak):	FSI	AC
Broadband Peak:		C
Spectrum:	FS	Z

Instrument Serial Number:		2548189
Microphone Serial Number:		2543364
Input:		Top Socket
Windscreen Correction:		None
Sound Field Correction:		Diffuse-field

Calibration Time:		11/04/2009 17:46:40
Calibration Type:		External reference
Sensitivity:		54.69 mV/Pa

HB001

	Start time	End time	Elapsed time	Overload [%]	LAeq [dB]	LAFmax [dB]	LAFmin [dB]
Value				0.00	47.1	57.2	41.2
Time	11:24:54 AM	11:34:54 AM	0:10:00				
Date	11/05/2009	11/05/2009					


HB001
dB
11/05/2009 11:24:54 AM - 11:34:54 AM
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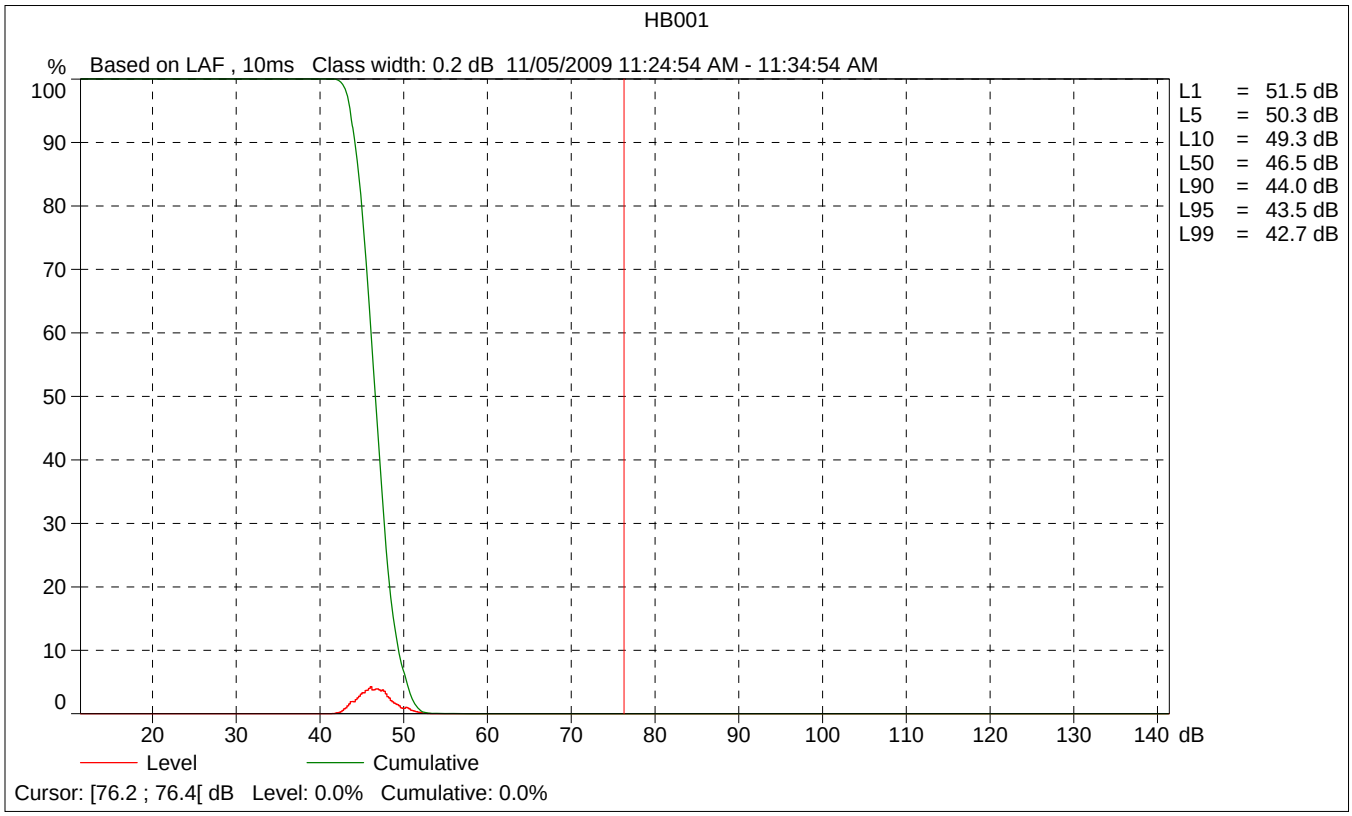
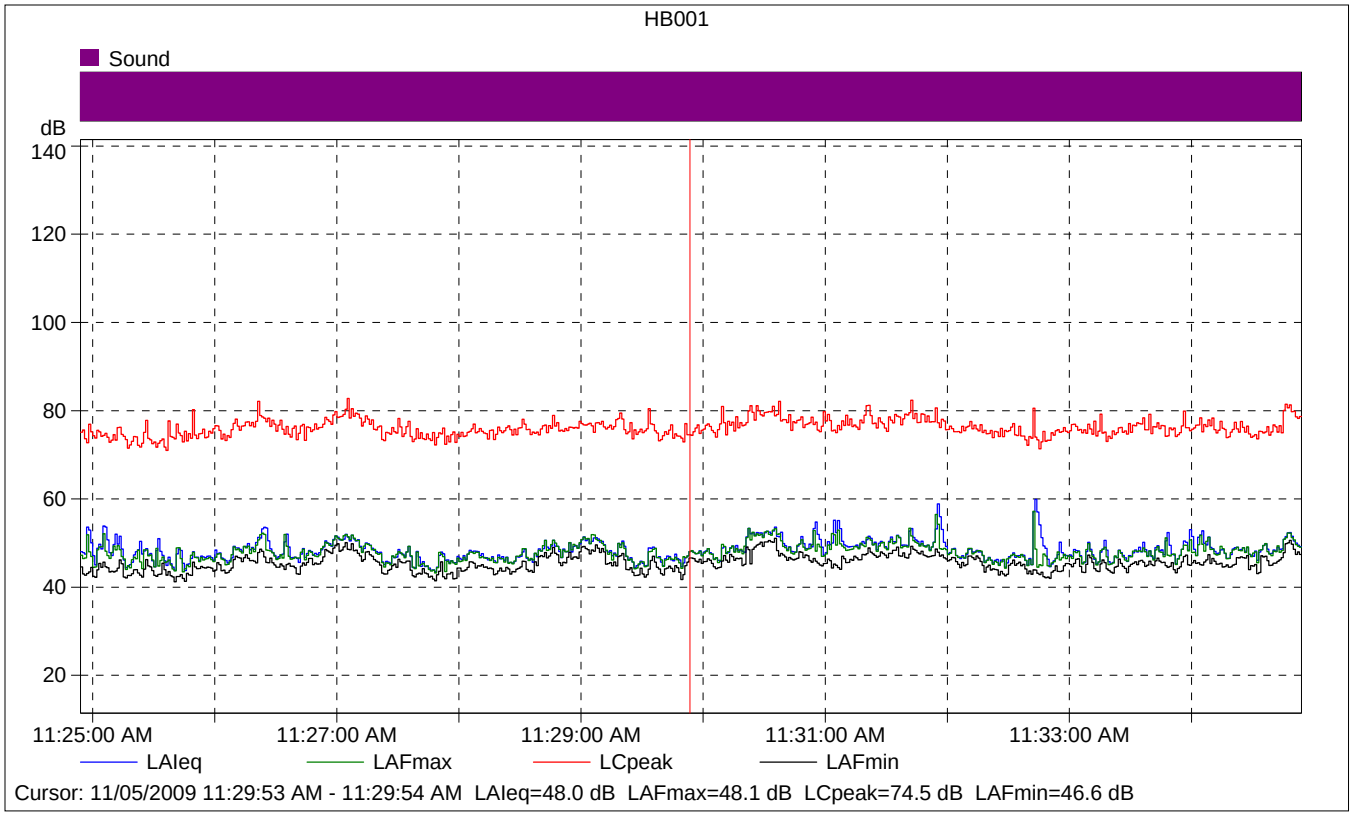
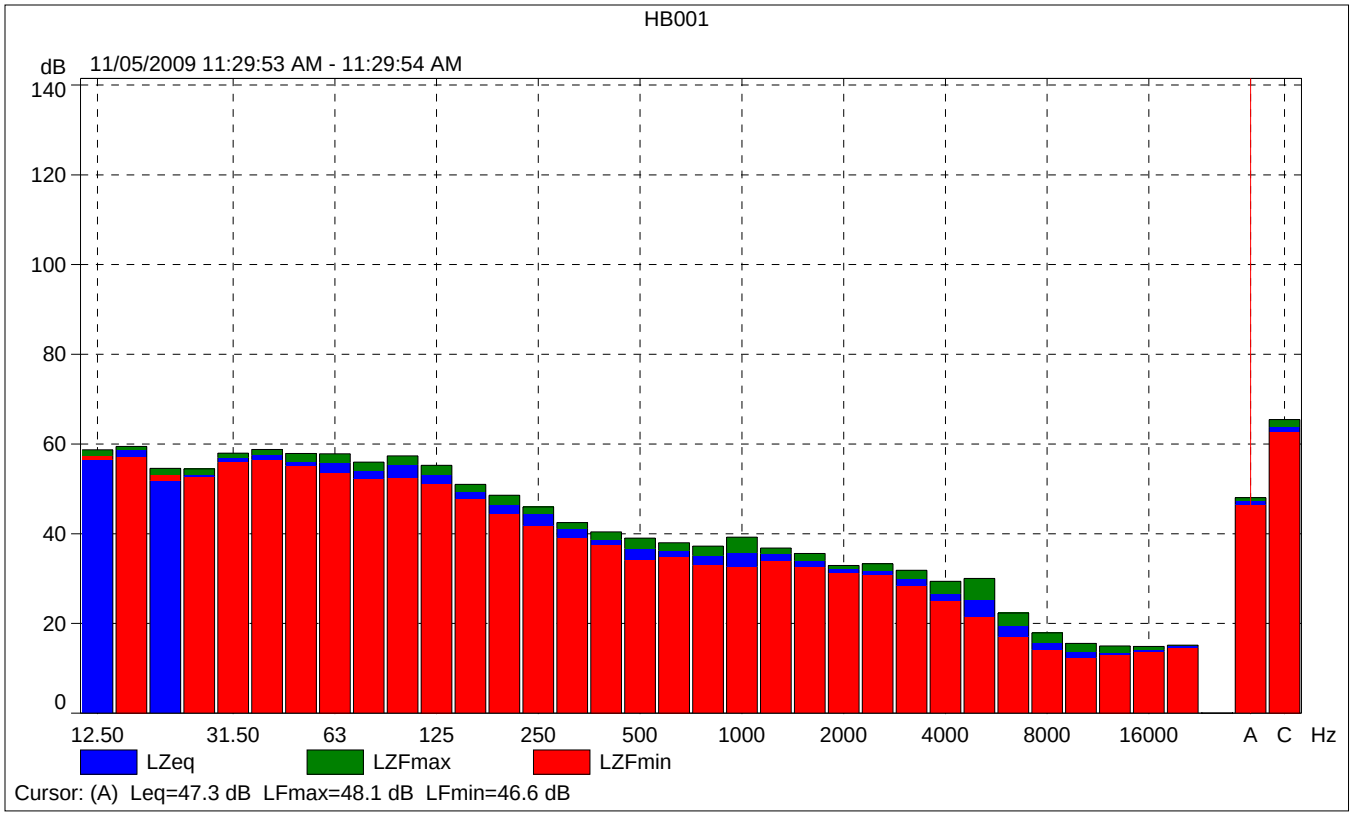
120
110
100
90
80
70
60
50
40
30
20
10
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=47.1 dB LFmax=57.2 dB LFmin=41.2 dB


HB001
%
Based on LAF , 10ms Class width: 0.2 dB 11/05/2009 11:24:54 AM - 11:34:54 AM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 51.5 dB
L5 = 50.3 dB
L10 = 49.3 dB
L50 = 46.5 dB
L90 = 44.0 dB
L95 = 43.5 dB
L99 = 42.7 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%



HB001

	Start time	Elapsed time	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			48.0	48.1	46.6
Time	11:29:53 AM	0:00:01			
Date	11/05/2009				


HB001
dB
11/05/2009 11:29:53 AM - 11:29:54 AM
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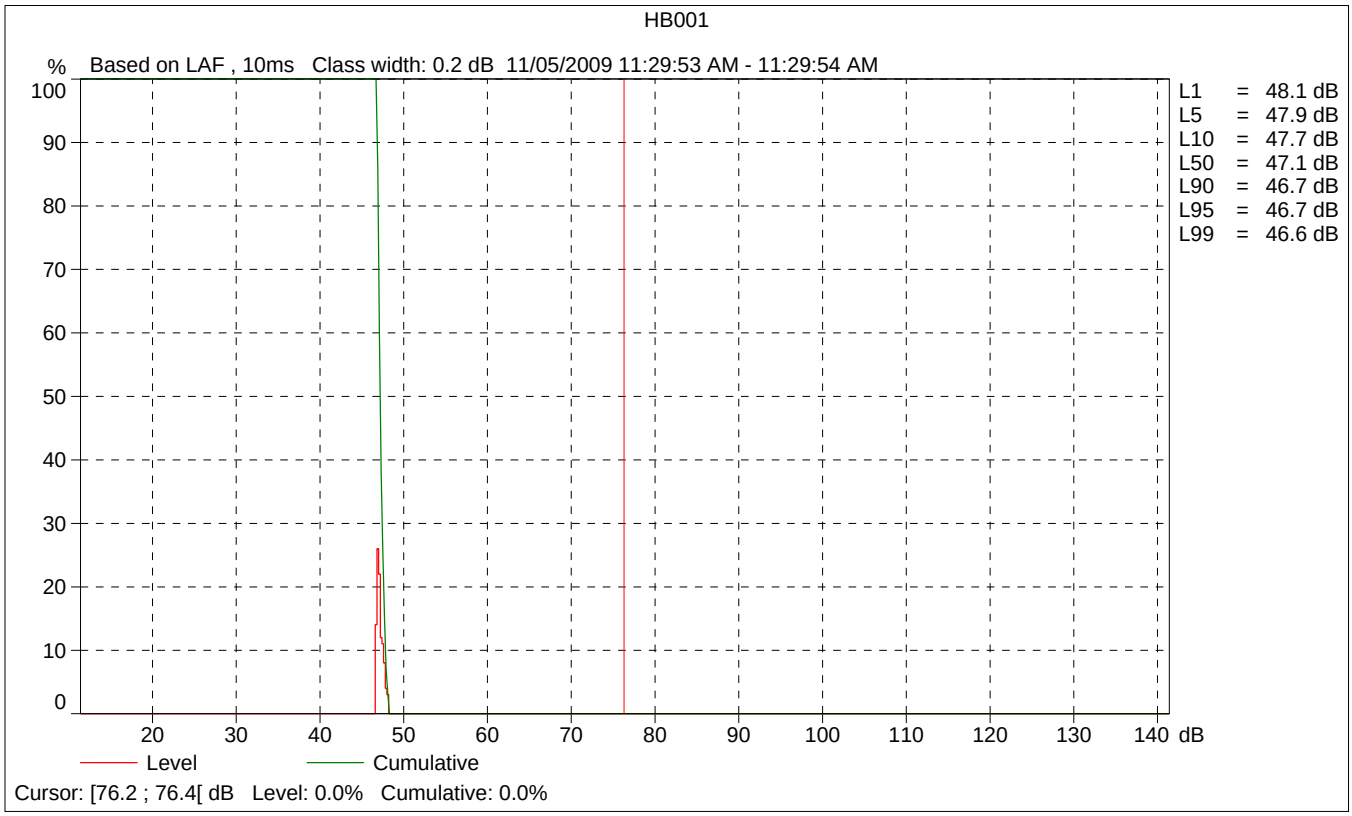
120
100
80
60
40
20
0
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=47.3 dB LFmax=48.1 dB LFmin=46.6 dB


HB001
%
Based on LAF , 10ms Class width: 0.2 dB 11/05/2009 11:29:53 AM - 11:29:54 AM
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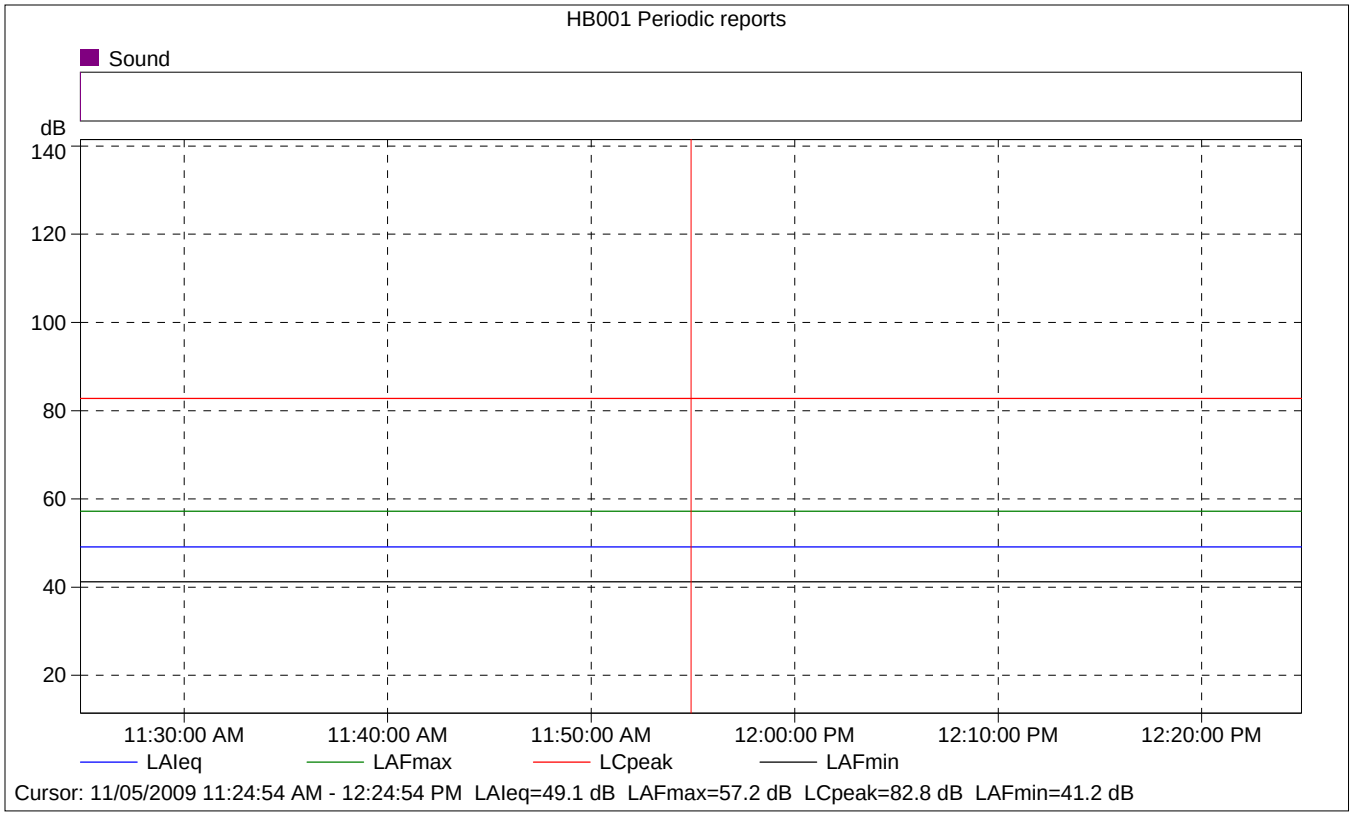
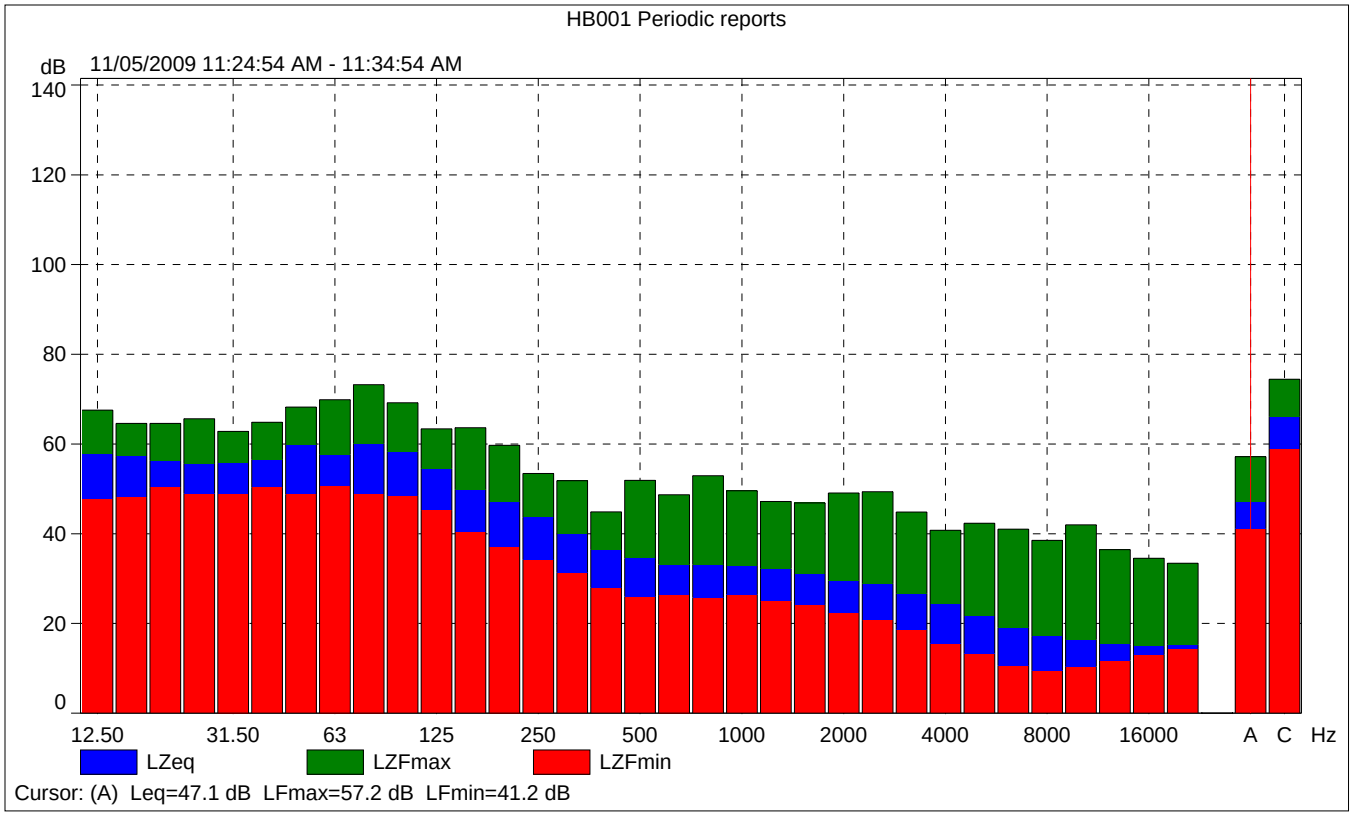
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140 dB
L1 = 48.1 dB
L5 = 47.9 dB
L10 = 47.7 dB
L50 = 47.1 dB
L90 = 46.7 dB
L95 = 46.7 dB
L99 = 46.6 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%



HB001 Periodic reports

	Start time	Elapsed time	Overload [%]	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			0.00	49.1	57.2	41.2
Time	11:24:54 AM	0:10:00				
Date	11/05/2009					


HB001 Periodic reports
dB
11/05/2009 11:24:54 AM - 11:34:54 AM
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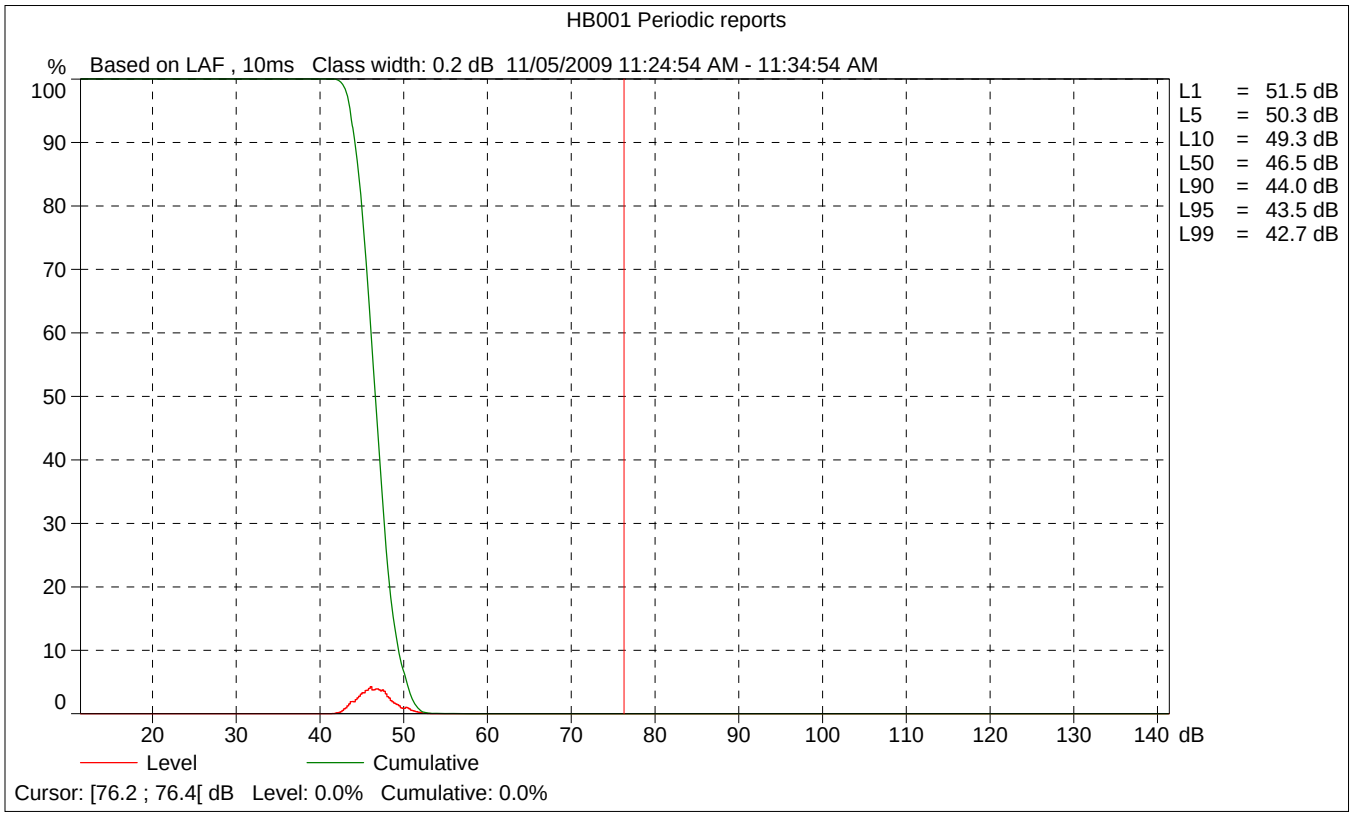
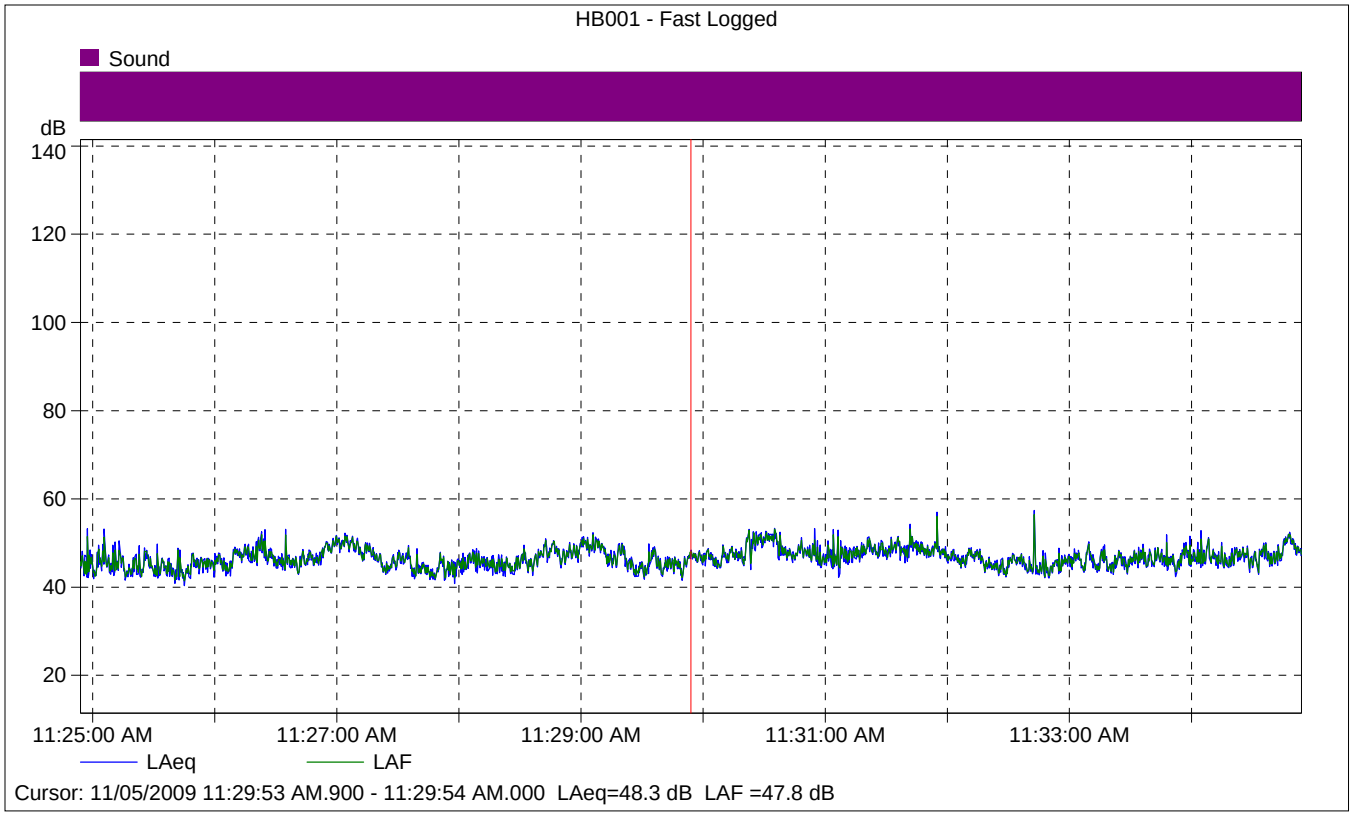
120
100
80
60
40
20
0
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=47.1 dB LFmax=57.2 dB LFmin=41.2 dB


HB001 Periodic reports
%
Based on LAF , 10ms Class width: 0.2 dB 11/05/2009 11:24:54 AM - 11:34:54 AM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 51.5 dB
L5 = 50.3 dB
L10 = 49.3 dB
L50 = 46.5 dB
L90 = 44.0 dB
L95 = 43.5 dB
L99 = 42.7 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%



HB001 - Fast Logged

	Start time	Elapsed time	LAeq [dB]
Value			48.3
Time	11:29:53 AM.900	0:00:00.100	
Date	11/05/2009		

Site Number: #2 (HB # 002)	
Recorded By: Brian Allee	
Job Number: 15102152	
Date: 11/05/2009	
Time: 10:48 AM	
Location: Rhodesia Drive cul-de-sac, adjacent to project site.	
GPS:	
Source of Peak Noise: Vehicular noise on Magnolia Street and Rhodesia Drive – Plane flew over – Birds chirping.	

Noise Data			
Leq (dB)	**Lmin (dB)**	**Lmax (dB)**	**Peak (dB)**
50.0	38.5	68.2	88.8

Equipment						
Category	**Type**	**Vendor**	**Model**	**Serial No.**	**Cert. Date**	**Note**
Sound	Sound Level Meter	**Brüel & Kjær**	**2250**	**2548189**	**9/10/2009**	
	Microphone	**Brüel & Kjær**	**4189**	**2543364**	**9/10/2009**	
	Preamp	**Brüel & Kjær**	**ZC 0032**	**4265**	**9/10/2009**	
	Calibrator	**Brüel & Kjær**	**4231**	**2545667**	**9/10/2009**	

Weather Data			
Est.	**Duration:** 10 minutes		**Sky:** ☼
	Note: dBA Offset = -0.02		**Sensor Height (ft):** 5 ft
	Wind Ave Speed (mph / m/s)	**Temperature (degrees Fahrenheit)**	**Barometer Pressure (hPa)**
	0.7	78.6	1019.7

Photo of Measurement Location

2250

Instrument:		2250
Application:		BZ7225 Version 2.0.2
Start Time:		11/05/2009 11:48:41
End Time:		11/05/2009 11:58:50
Elapsed Time:		00:10:00
Bandwidth:		1/3-octave
Max Input Level:		140.16

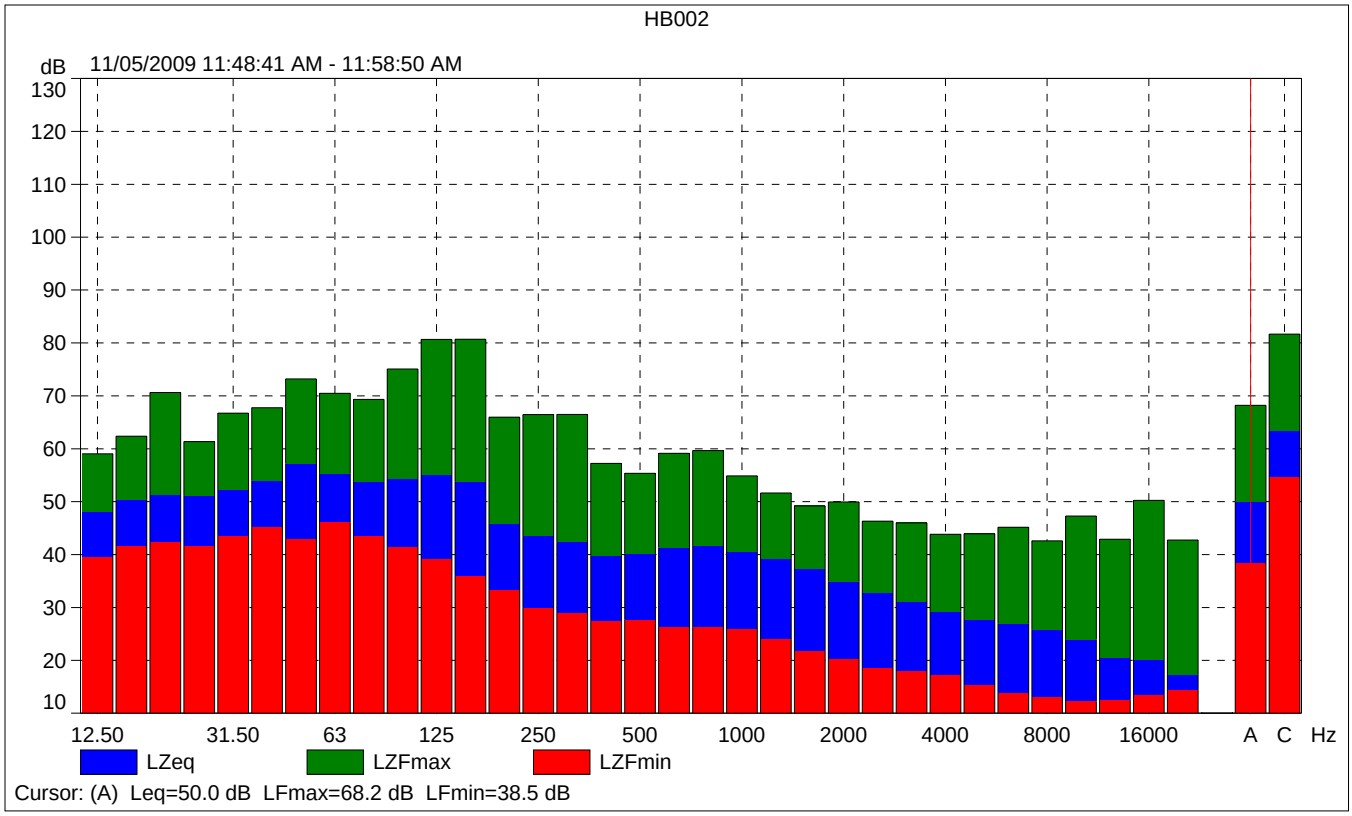
	Time	Frequency
Broadband (excl. Peak):	FSI	AC
Broadband Peak:		C
Spectrum:	FS	Z

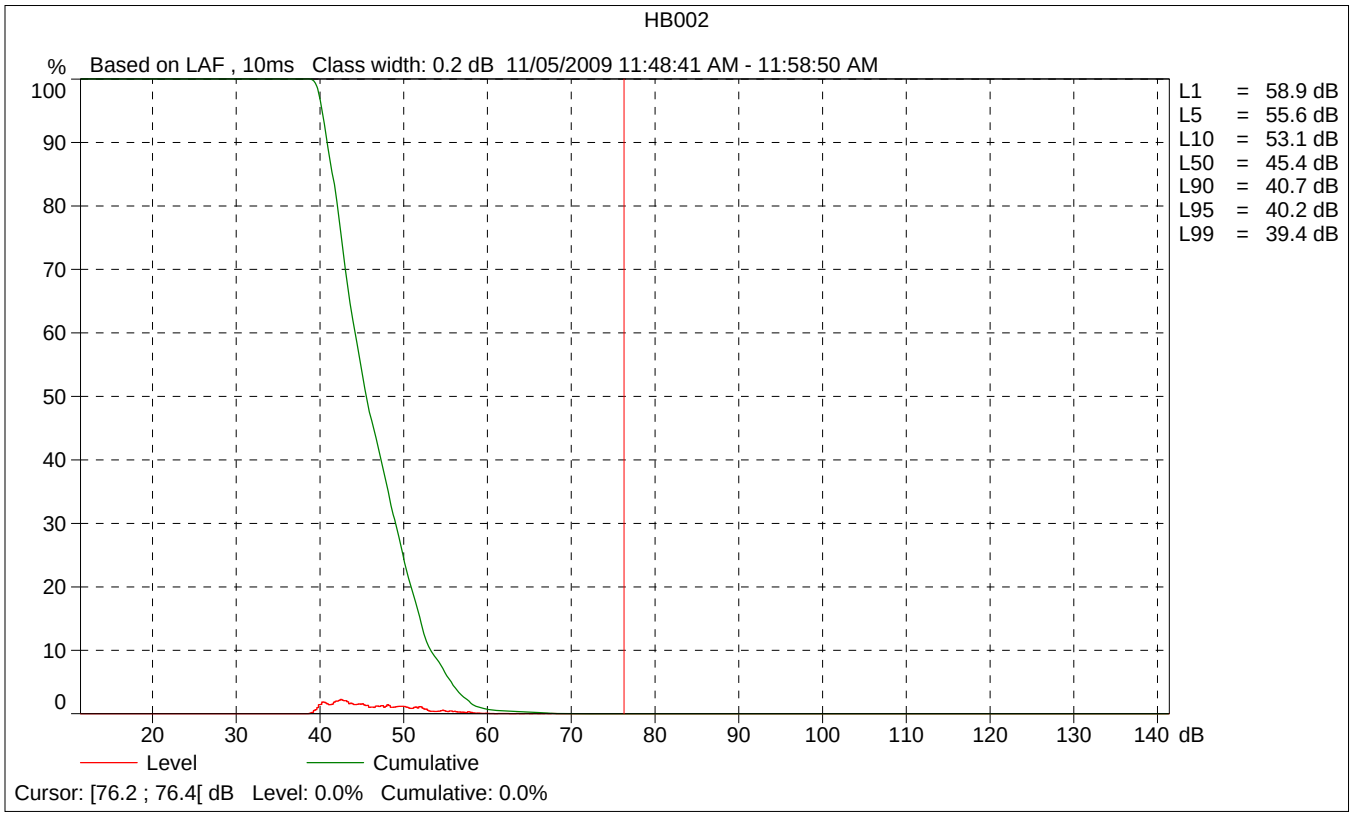
Instrument Serial Number:		2548189
Microphone Serial Number:		2543364
Input:		Top Socket
Windscreen Correction:		None
Sound Field Correction:		Diffuse-field

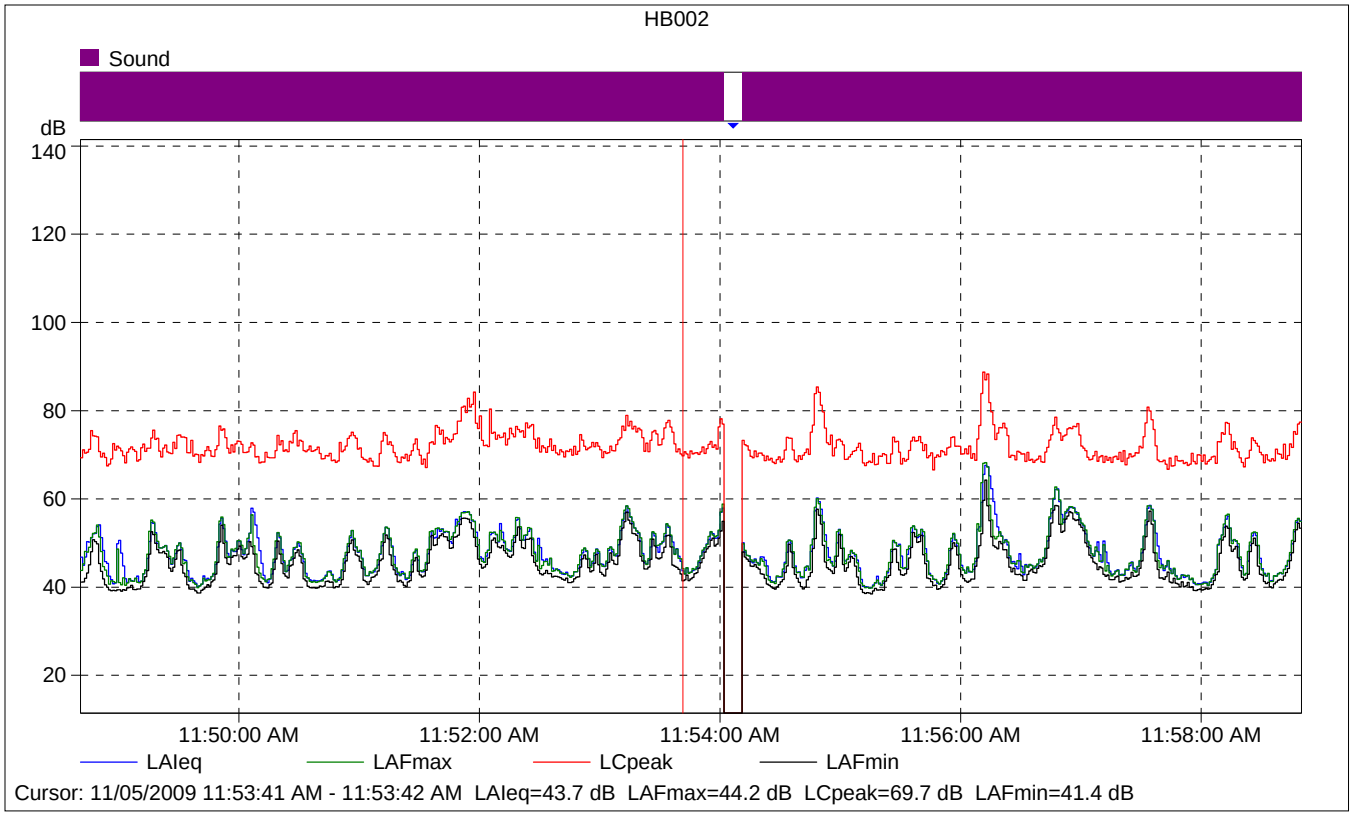
Calibration Time:		11/04/2009 17:46:40
Calibration Type:		External reference
Sensitivity:		54.69 mV/Pa

HB002

	Start time	End time	Elapsed time	Overload [%]	LAeq [dB]	LAFmax [dB]	LAFmin [dB]
Value				0.00	50.0	68.2	38.5
Time	11:48:41 AM	11:58:50 AM	0:10:00				
Date	11/05/2009	11/05/2009					

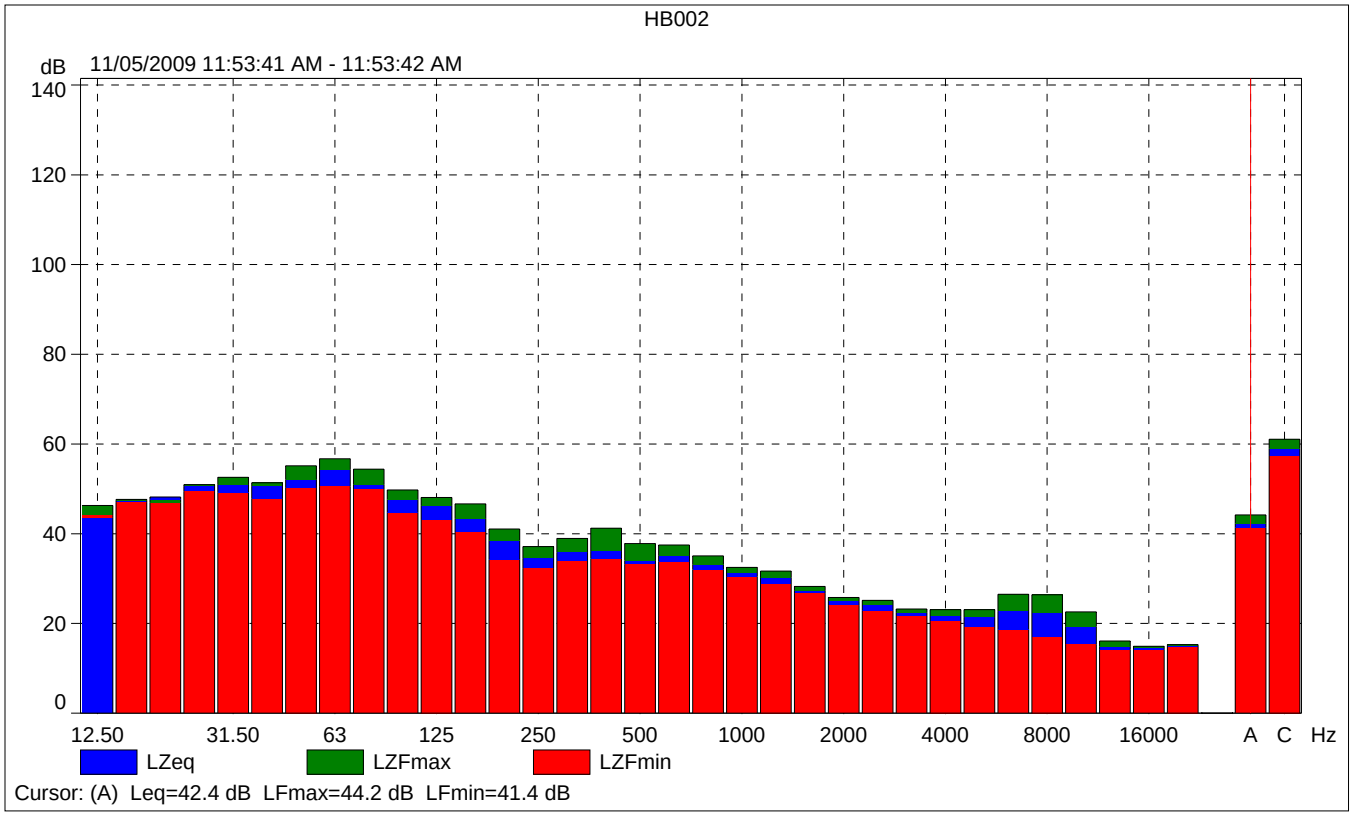

HB002
dB
11/05/2009 11:48:41 AM - 11:58:50 AM
130
120
110
100
90
80
70
60
50
40
30
20
10
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=50.0 dB LFmax=68.2 dB LFmin=38.5 dB

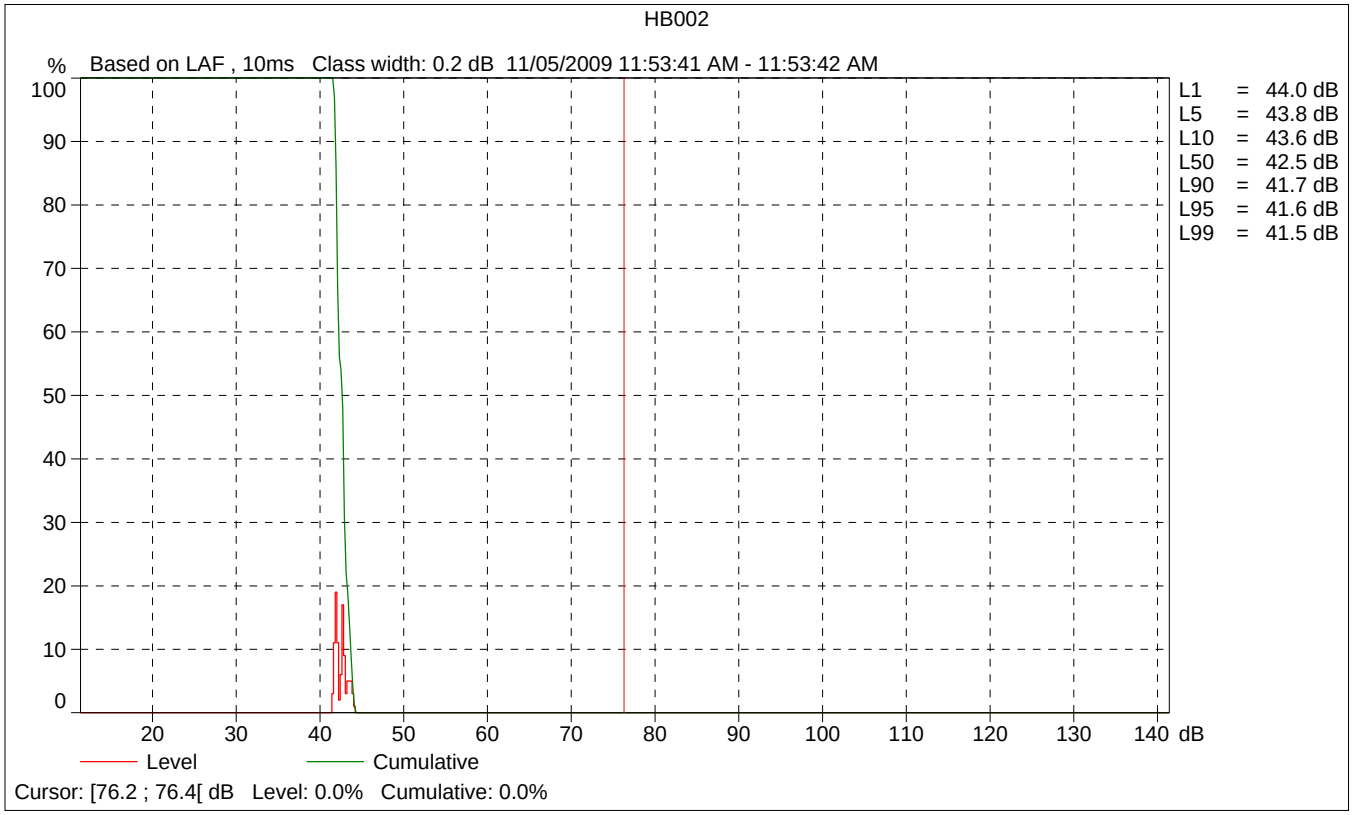

HB002
%
Based on LAF , 10ms Class width: 0.2 dB 11/05/2009 11:48:41 AM - 11:58:50 AM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140 dB
L1 = 58.9 dB
L5 = 55.6 dB
L10 = 53.1 dB
L50 = 45.4 dB
L90 = 40.7 dB
L95 = 40.2 dB
L99 = 39.4 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%

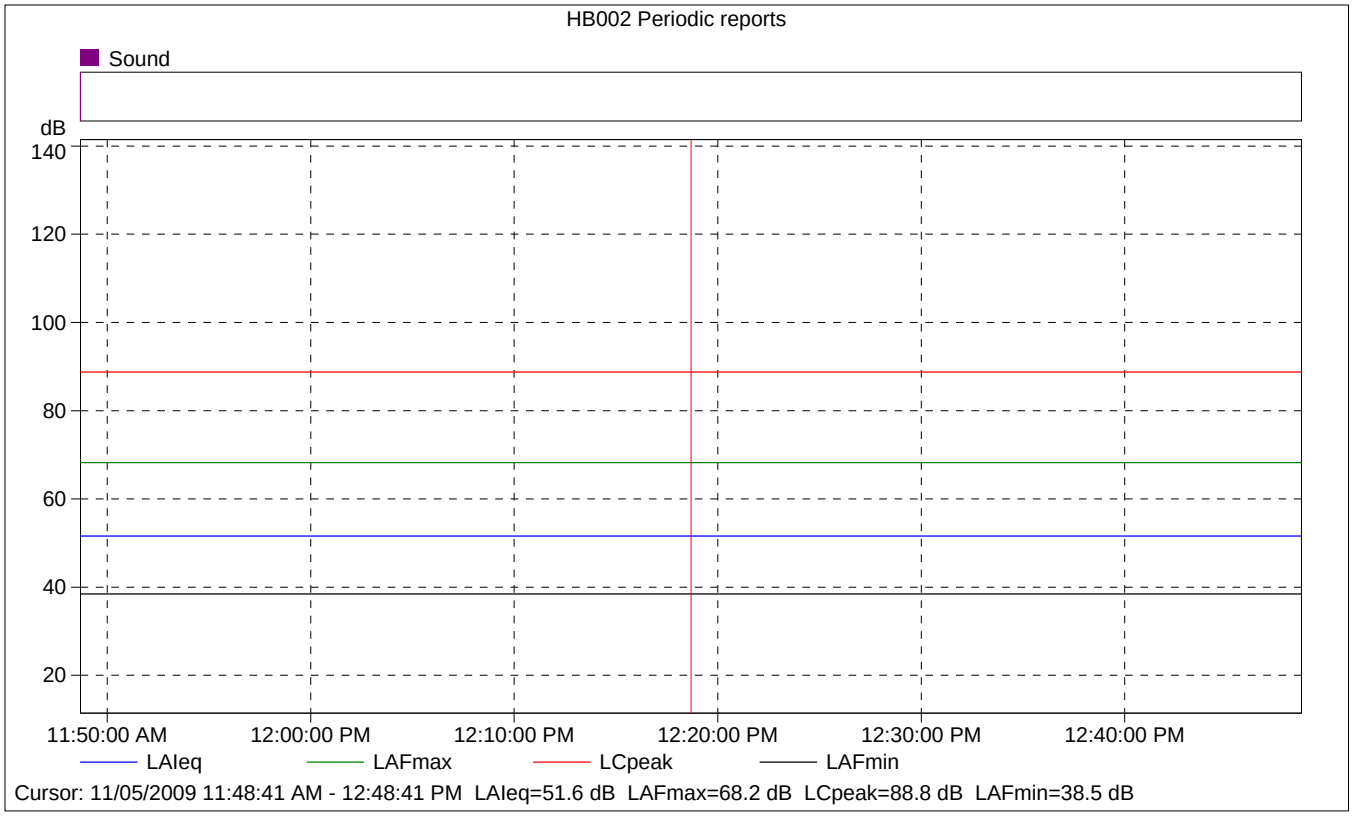


HB002

	Start time	Elapsed time	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			43.7	44.2	41.4
Time	11:53:41 AM	0:00:01			
Date	11/05/2009				

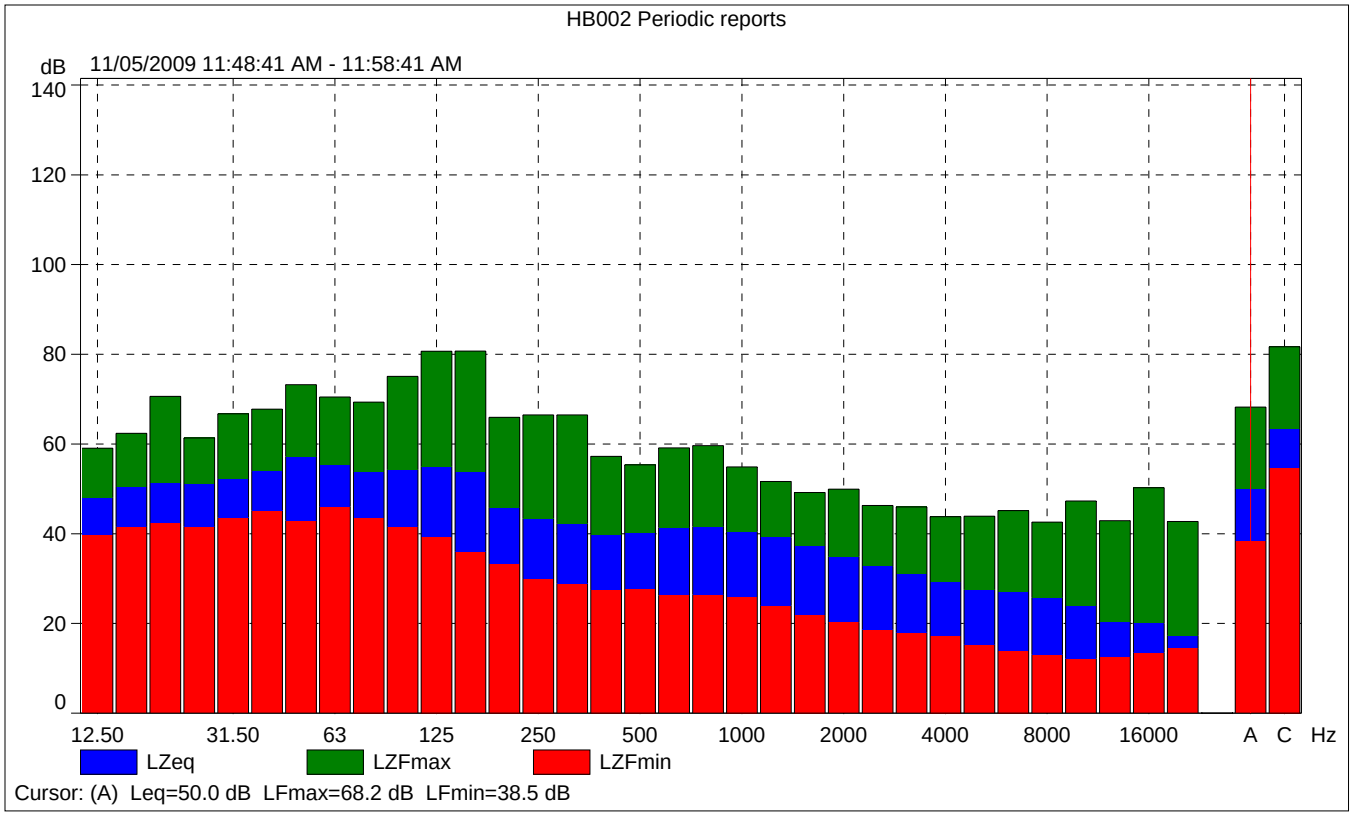

HB002
dB
11/05/2009 11:53:41 AM - 11:53:42 AM
140
120
100
80
60
40
20
0
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=42.4 dB LFmax=44.2 dB LFmin=41.4 dB

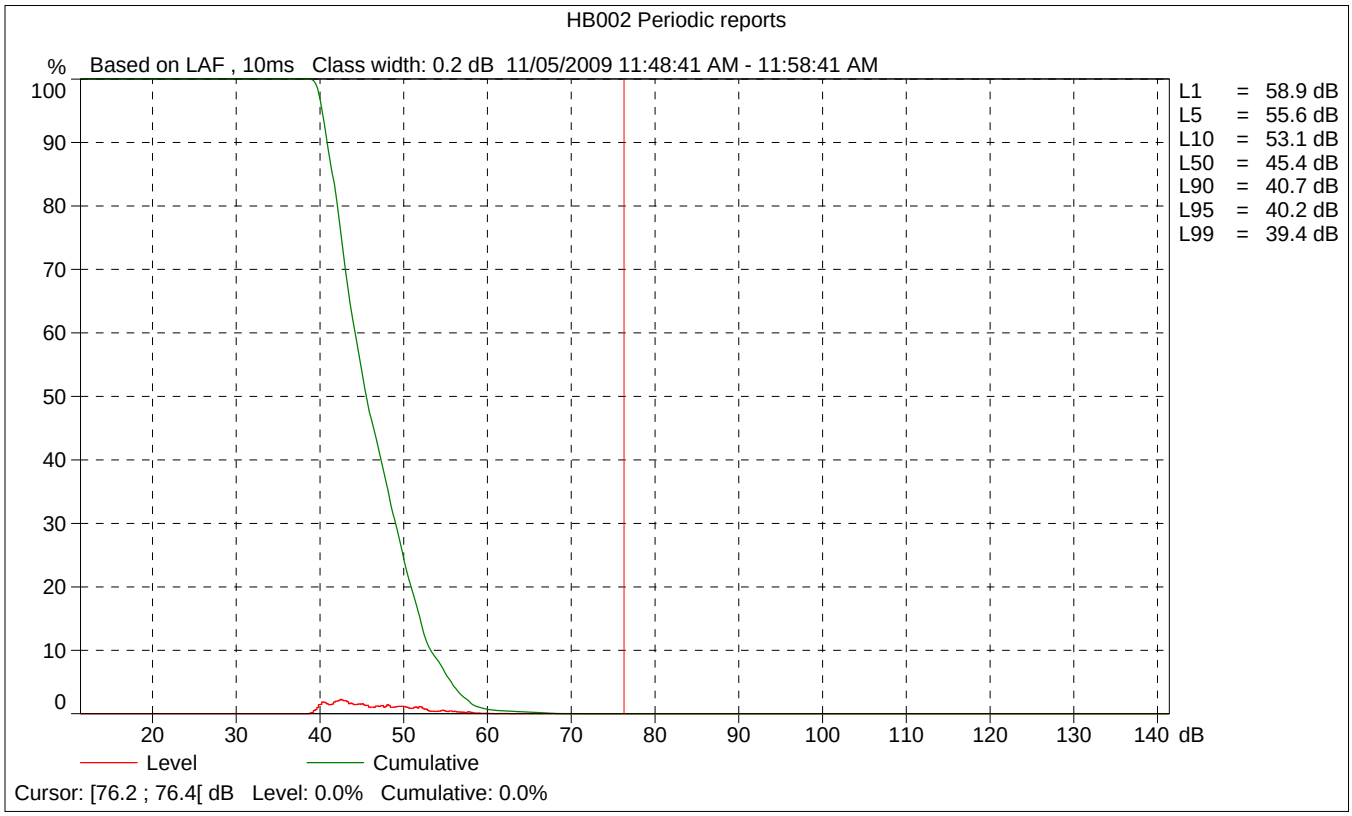

HB002
%
Based on LAF , 10ms Class width: 0.2 dB 11/05/2009 11:53:41 AM - 11:53:42 AM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140 dB
L1 = 44.0 dB
L5 = 43.8 dB
L10 = 43.6 dB
L50 = 42.5 dB
L90 = 41.7 dB
L95 = 41.6 dB
L99 = 41.5 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%

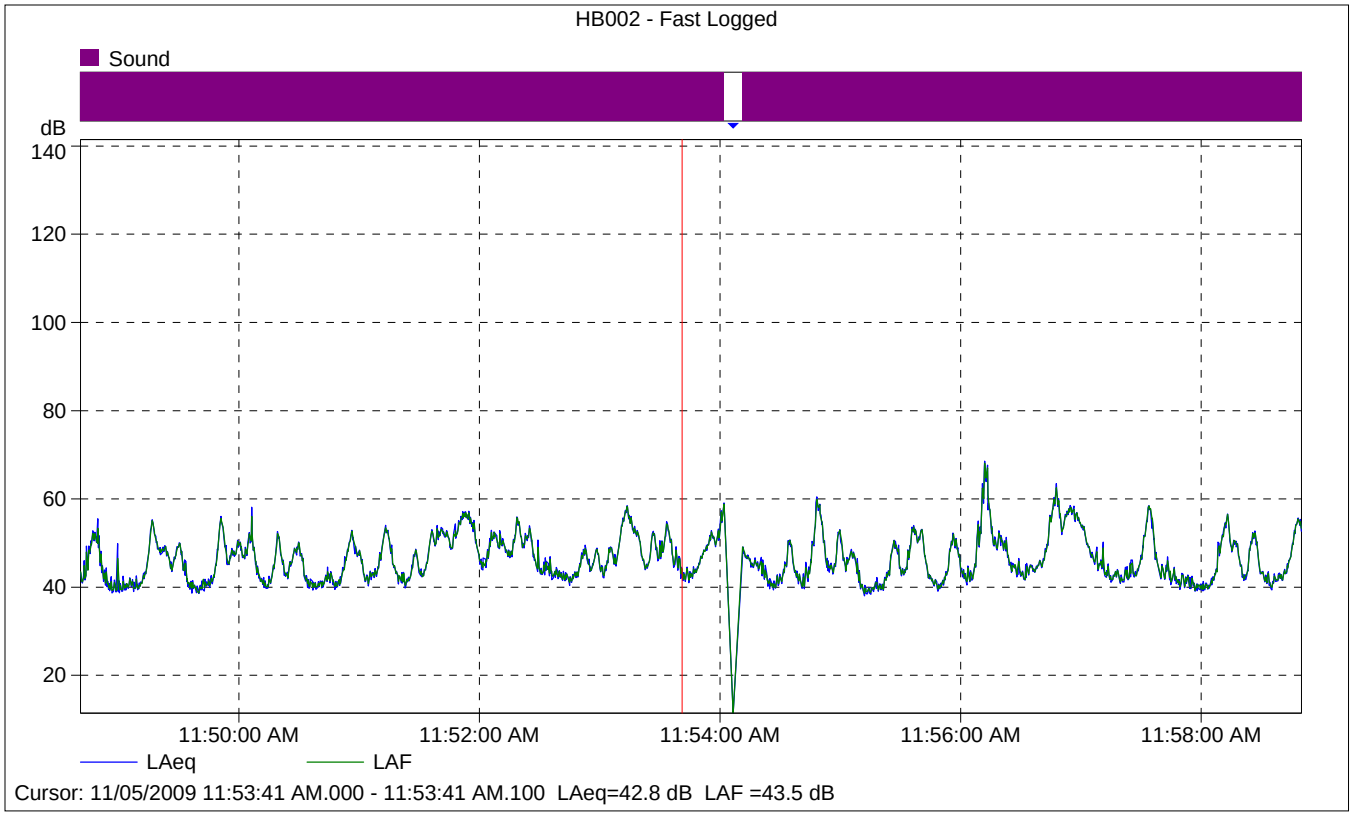


HB002 Periodic reports

	Start time	Elapsed time	Overload [%]	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			0.00	51.6	68.2	38.5
Time	11:48:41 AM	0:10:00				
Date	11/05/2009					


HB002 Periodic reports
dB
11/05/2009 11:48:41 AM - 11:58:41 AM
140
120
100
80
60
40
20
0
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=50.0 dB LFmax=68.2 dB LFmin=38.5 dB


HB002 Periodic reports
%
Based on LAF , 10ms Class width: 0.2 dB 11/05/2009 11:48:41 AM - 11:58:41 AM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 58.9 dB
L5 = 55.6 dB
L10 = 53.1 dB
L50 = 45.4 dB
L90 = 40.7 dB
L95 = 40.2 dB
L99 = 39.4 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%



HB002 - Fast Logged

	Start time	Elapsed time	LAeq [dB]
Value			42.8
Time	11:53:41 AM	0:00:00.100	
Date	11/05/2009		

Site Number: #3 (HB #003)			
Recorded By: Brian Allee			
Job Number: 15102152			
Date: 11/05/2009			
Time: 11:09 AM			
Location: Hatteras Drive and Breton Lane, adjacent to project site and Edison Community Park			
GPS:			
Source of Peak Noise: Vehicular noise from Hatteras Drive, Breton Lane, and Hamilton Avenue – Three planes flew over – Neighbor working outside of garage – Wind chimes – Dogs barking – Birds chirping.			
Noise Data			
Leq (dB)	**Lmin (dB)**	**Lmax (dB)**	**Peak (dB)**
48.4	36.3	62.6	86.1

Equipment						
Category	**Type**	**Vendor**	**Model**	**Serial No.**	**Cert. Date**	**Note**
Sound	Sound Level Meter	**Brüel & Kjær**	**2250**	**2548189**	**9/10/2009**	
	Microphone	**Brüel & Kjær**	**4189**	**2543364**	**9/10/2009**	
	Preamp	**Brüel & Kjær**	**ZC 0032**	**4265**	**9/10/2009**	
	Calibrator	**Brüel & Kjær**	**4231**	**2545667**	**9/10/2009**	

Weather Data			
Est.	**Duration:** 10 minutes	**Sky:** ☼	
	Note: dBA Offset = -0.02	**Sensor Height (ft):** 5 ft	
	Wind Ave Speed (mph / m/s)	**Temperature (degrees Fahrenheit)**	**Barometer Pressure (hPa)**
	3.5	75.6	1019.9

Photo of Measurement Location

2250

Instrument:		2250
Application:		BZ7225 Version 2.0.2
Start Time:		11/05/2009 12:10:26
End Time:		11/05/2009 12:20:26
Elapsed Time:		00:10:00
Bandwidth:		1/3-octave
Max Input Level:		140.16

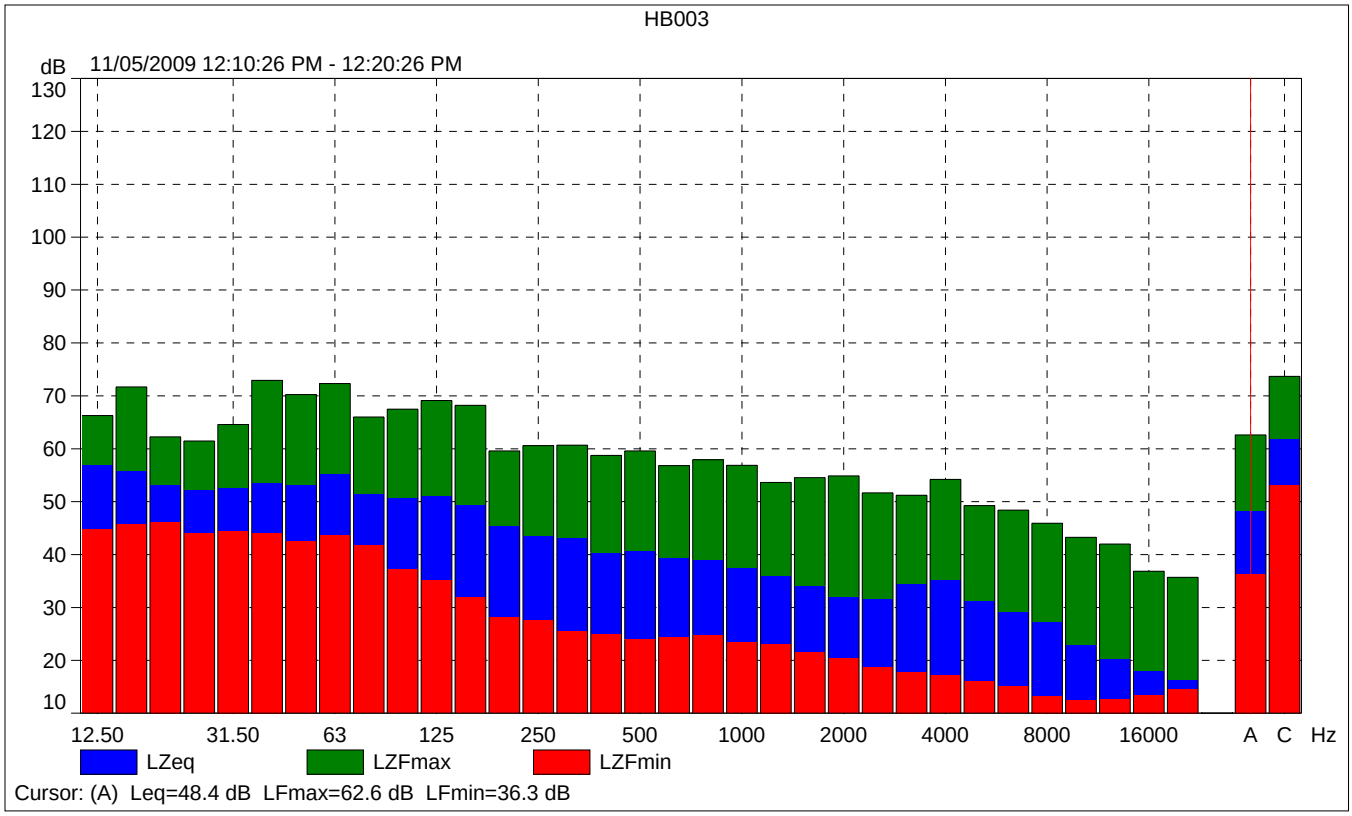
	Time	Frequency
Broadband (excl. Peak):	FSI	AC
Broadband Peak:		C
Spectrum:	FS	Z

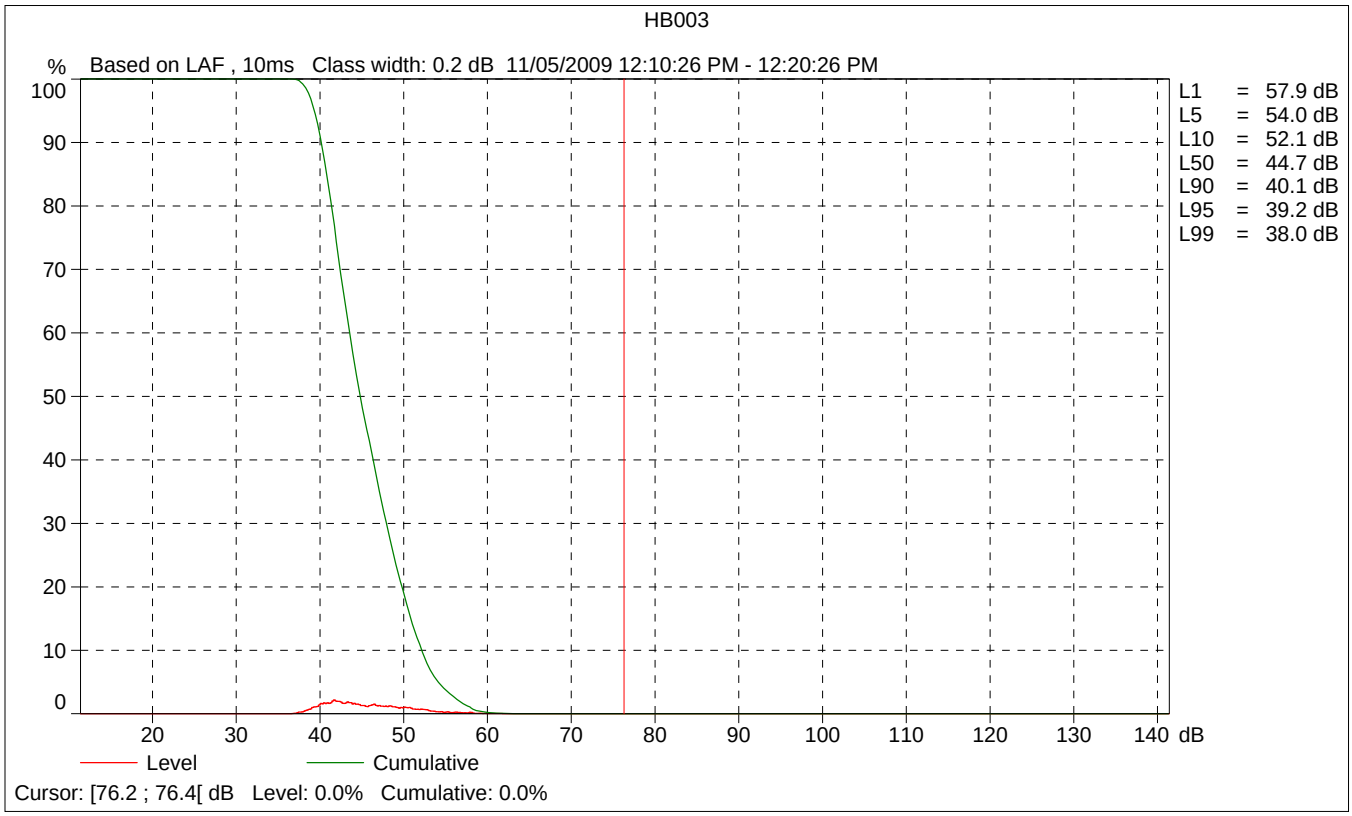
Instrument Serial Number:		2548189
Microphone Serial Number:		2543364
Input:		Top Socket
Windscreen Correction:		None
Sound Field Correction:		Diffuse-field

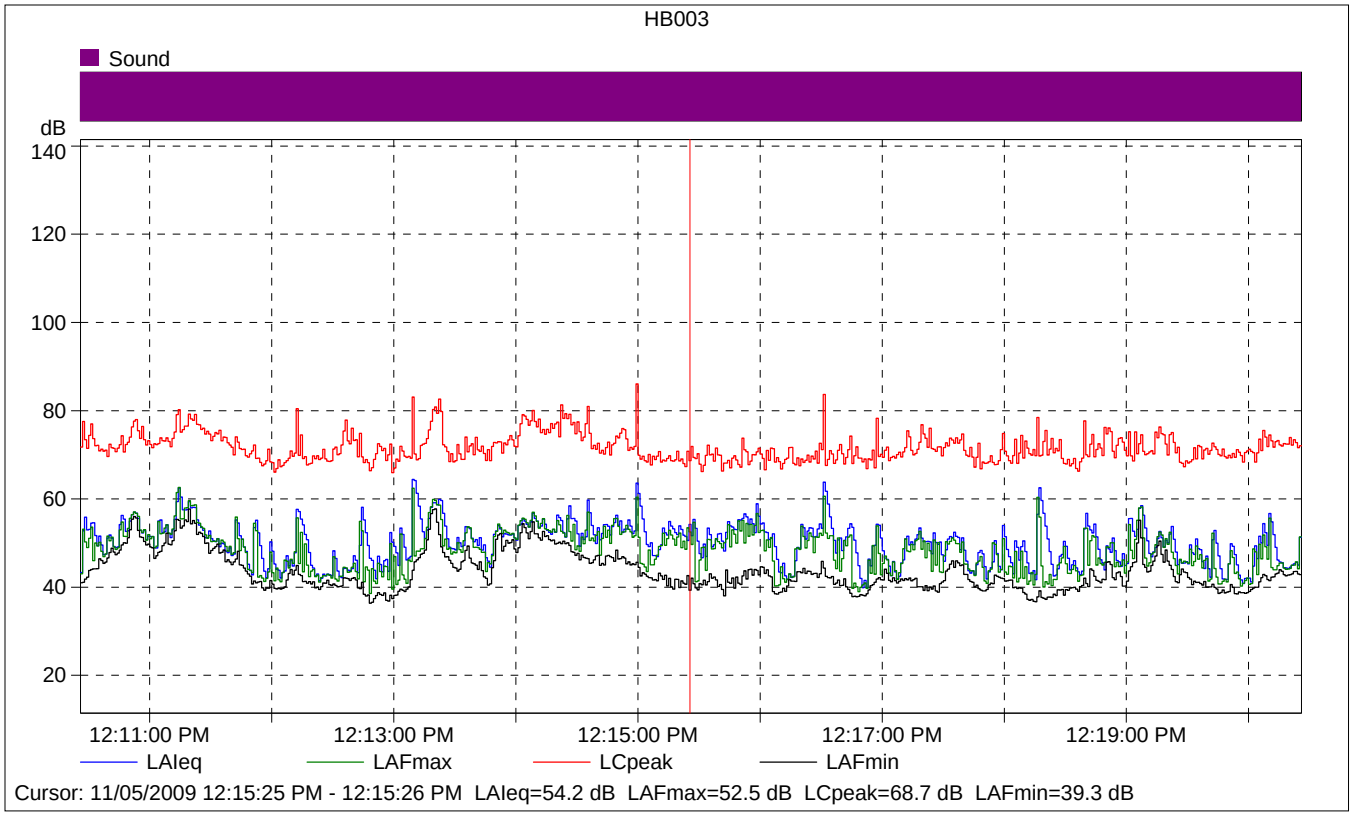
Calibration Time:		11/04/2009 17:46:40
Calibration Type:		External reference
Sensitivity:		54.69 mV/Pa

HB003

	Start time	End time	Elapsed time	Overload [%]	LAeq [dB]	LAFmax [dB]	LAFmin [dB]
Value				0.00	48.4	62.6	36.3
Time	12:10:26 PM	12:20:26 PM	0:10:00				
Date	11/05/2009	11/05/2009					

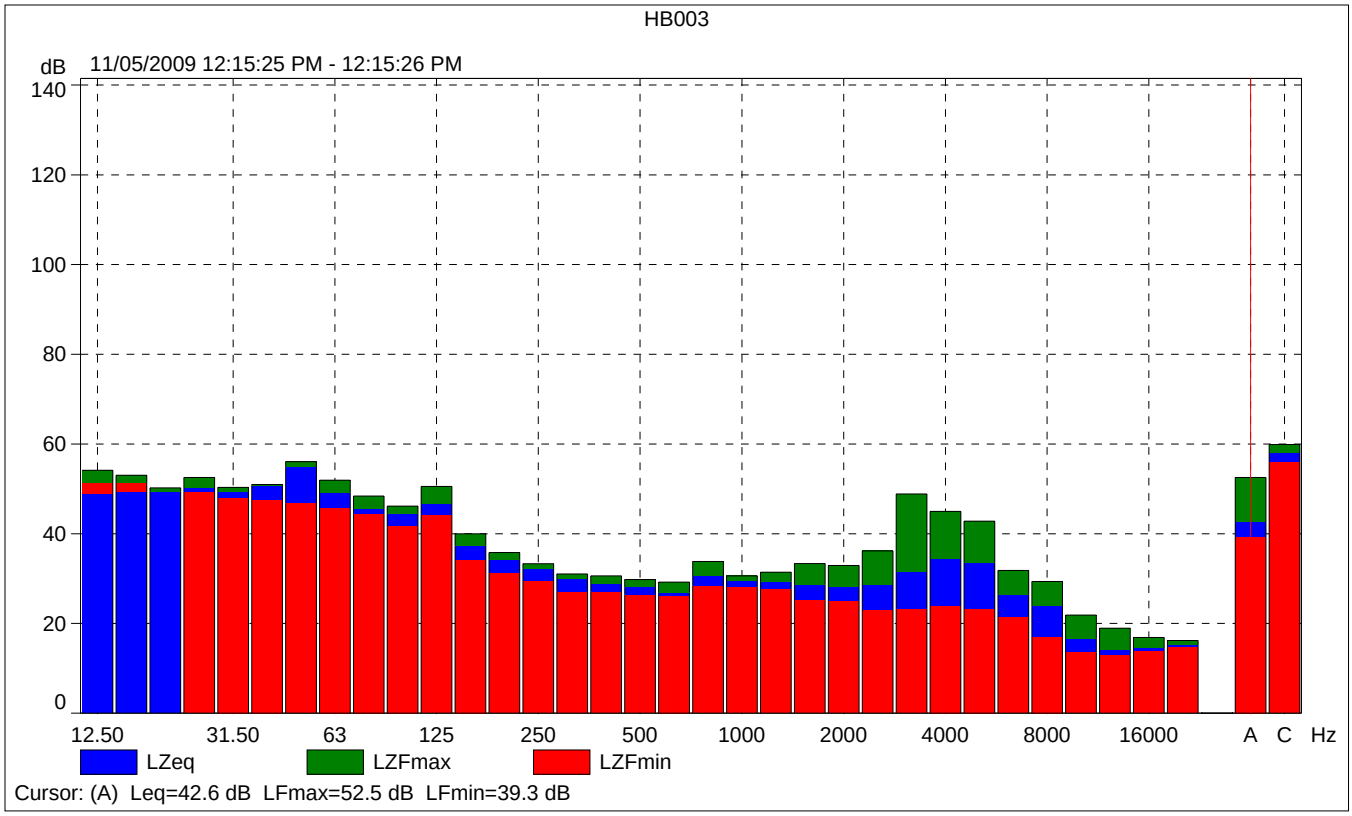

HB003
dB
11/05/2009 12:10:26 PM - 12:20:26 PM
130
120
110
100
90
80
70
60
50
40
30
20
10
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=48.4 dB LFmax=62.6 dB LFmin=36.3 dB

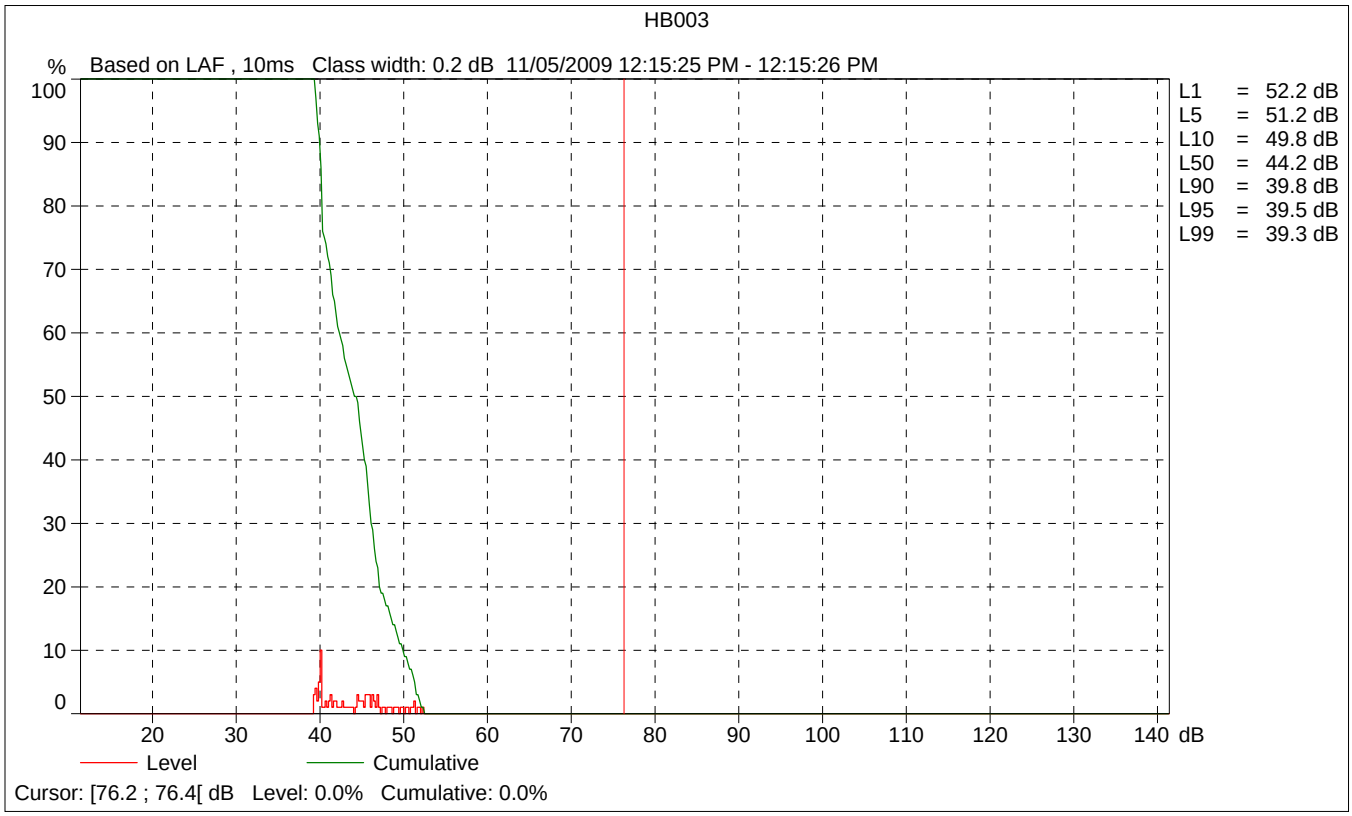

HB003
%
Based on LAF , 10ms Class width: 0.2 dB 11/05/2009 12:10:26 PM - 12:20:26 PM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140 dB
L1 = 57.9 dB
L5 = 54.0 dB
L10 = 52.1 dB
L50 = 44.7 dB
L90 = 40.1 dB
L95 = 39.2 dB
L99 = 38.0 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%

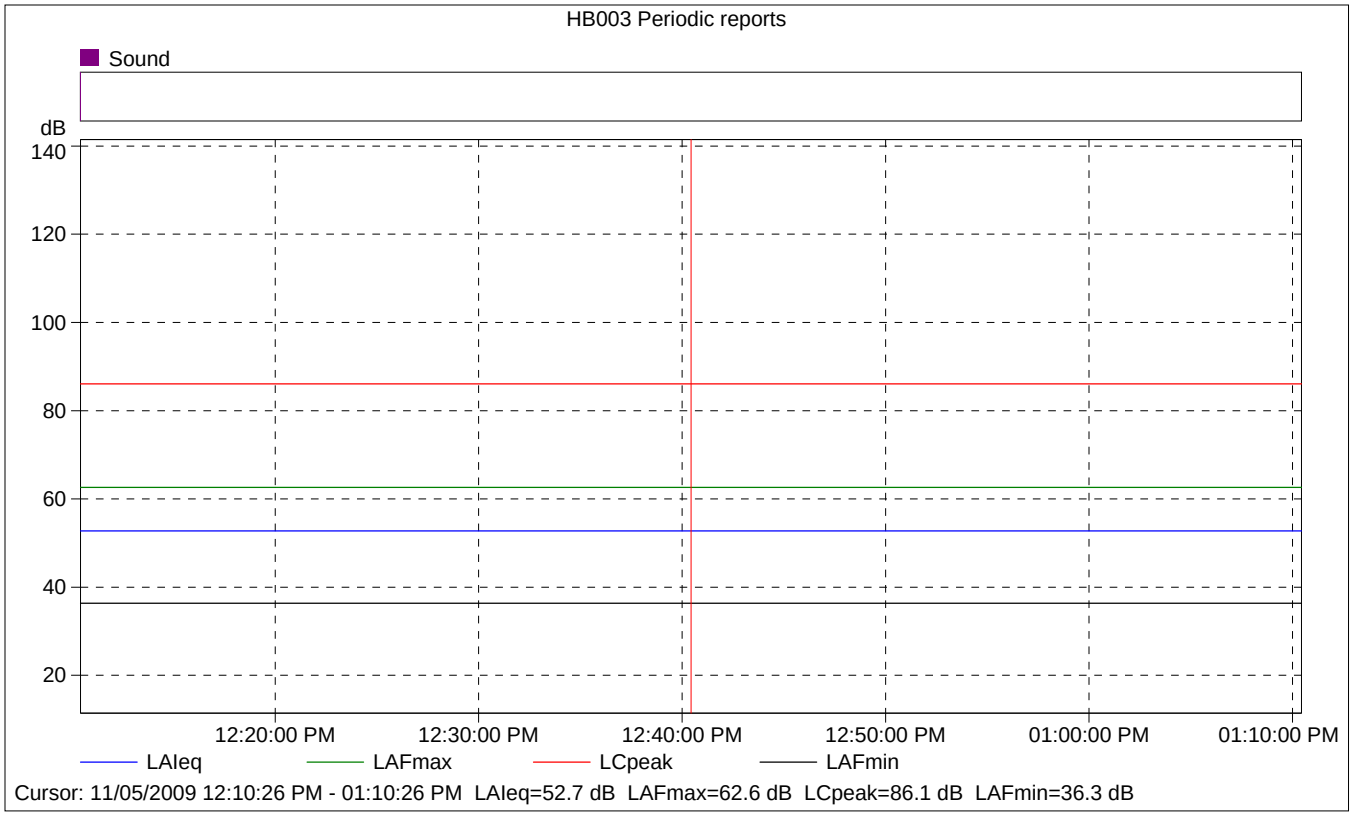


HB003

	Start time	Elapsed time	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			54.2	52.5	39.3
Time	12:15:25 PM	0:00:01			
Date	11/05/2009				

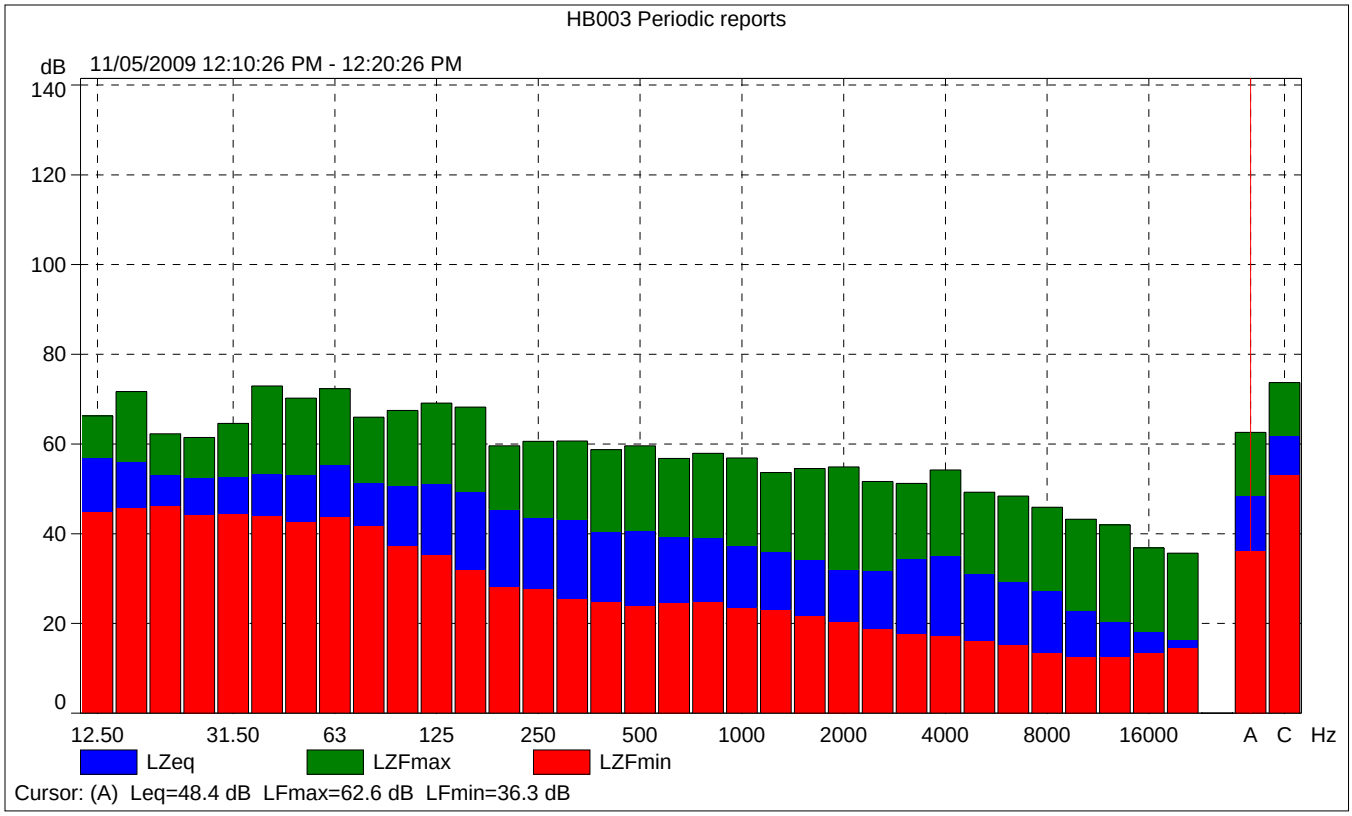

HB003
dB
11/05/2009 12:15:25 PM - 12:15:26 PM
140
120
100
80
60
40
20
0
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=42.6 dB LFmax=52.5 dB LFmin=39.3 dB

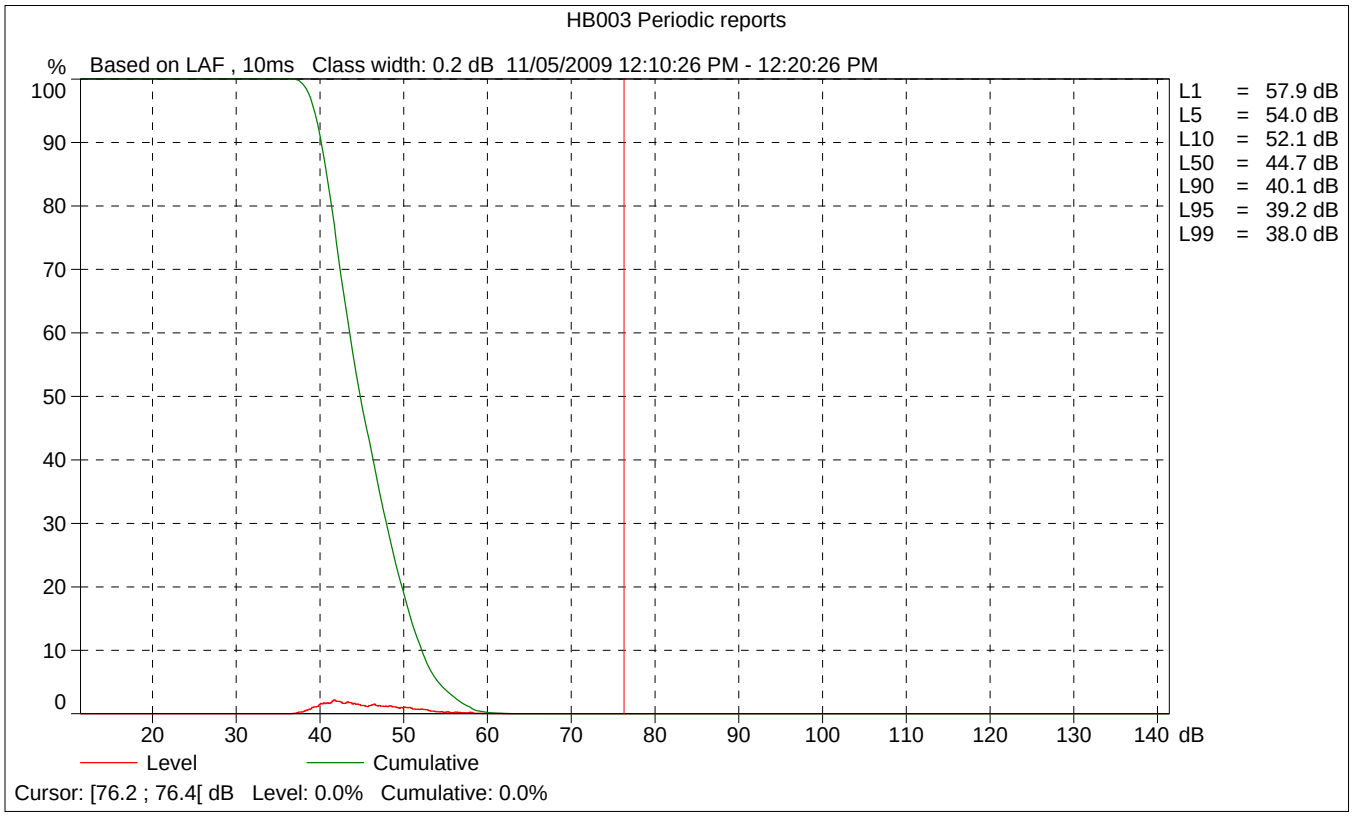

HB003
%
Based on LAF , 10ms Class width: 0.2 dB 11/05/2009 12:15:25 PM - 12:15:26 PM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 52.2 dB
L5 = 51.2 dB
L10 = 49.8 dB
L50 = 44.2 dB
L90 = 39.8 dB
L95 = 39.5 dB
L99 = 39.3 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%

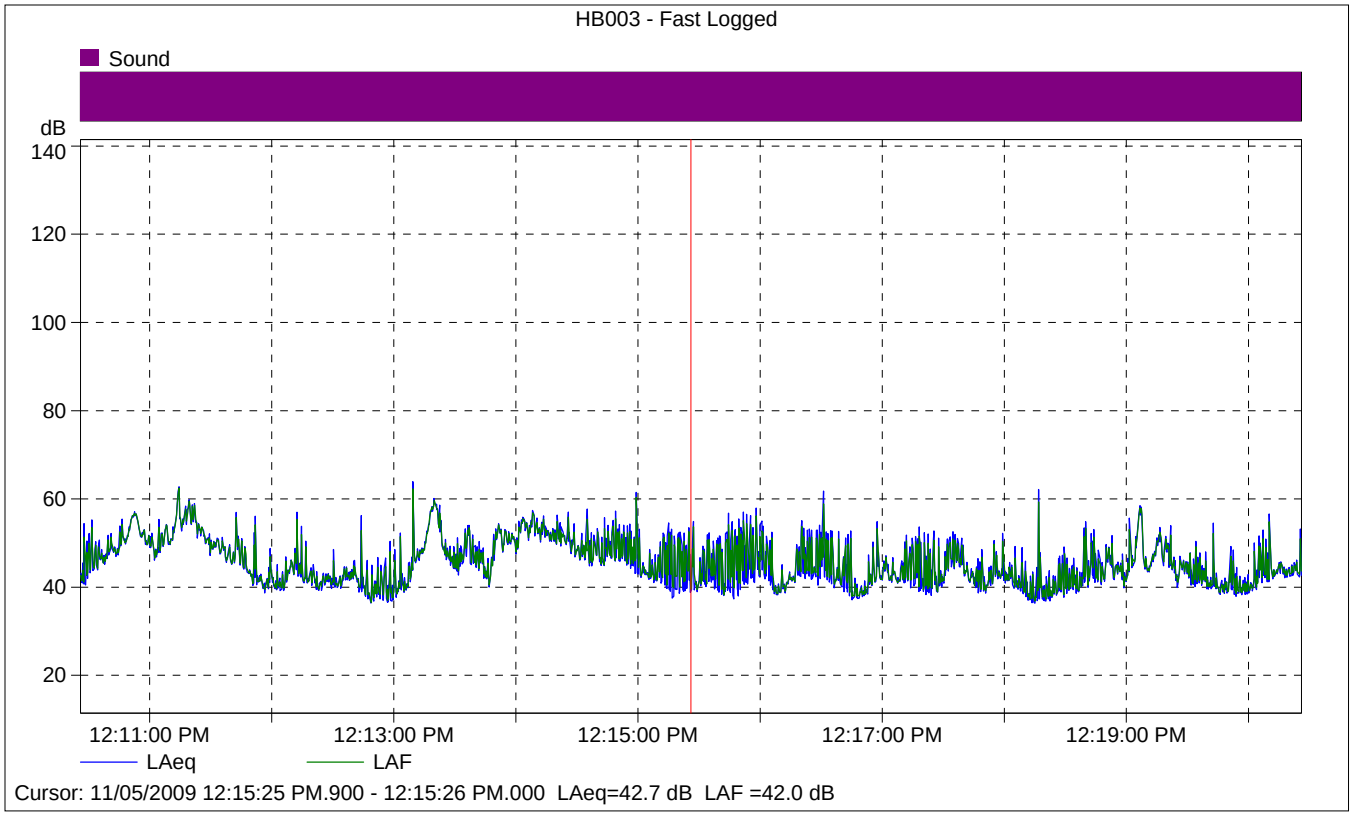


HB003 Periodic reports

	Start time	Elapsed time	Overload [%]	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			0.00	52.7	62.6	36.3
Time	12:10:26 PM	0:10:00				
Date	11/05/2009					


HB003 Periodic reports
dB
11/05/2009 12:10:26 PM - 12:20:26 PM
140
120
100
80
60
40
20
0
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=48.4 dB LFmax=62.6 dB LFmin=36.3 dB


HB003 Periodic reports
%
Based on LAF , 10ms Class width: 0.2 dB 11/05/2009 12:10:26 PM - 12:20:26 PM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 57.9 dB
L5 = 54.0 dB
L10 = 52.1 dB
L50 = 44.7 dB
L90 = 40.1 dB
L95 = 39.2 dB
L99 = 38.0 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%



HB003 - Fast Logged

	Start time	Elapsed time	LAeq [dB]
Value			42.7
Time	12:15:25 PM.900	0:00:00.100	
Date	11/05/2009		

Site Number: #4 (HB # 004)
Recorded By: Brian Allee
Job Number: 15102152
Date: 11/05/2009
Time: 11:35 AM
Location: Biscayne Drive and Newland Street, adjacent to project site and mobile home park.
GPS:
Source of Peak Noise: Major construction with large heavy trucks/equipment idling/braking/loading/unloading (portion of Newland Street closed down) – Vehicular noise on Biscayne Drive, Newland Street, and Pacific Coast Highway – Vehicles driving in/out from mobile home park and RV resort – Noise from plant – Birds chirping.

Noise Data			
Leq (dB)	**Lmin (dB)**	**Lmax (dB)**	**Peak (dB)**
62.6	45.3	80.3	101.9

Equipment						
Category	**Type**	**Vendor**	**Model**	**Serial No.**	**Cert. Date**	**Note**
Sound	Sound Level Meter	**Brüel & Kjær**	**2250**	**2548189**	**9/10/2009**	
	Microphone	**Brüel & Kjær**	**4189**	**2543364**	**9/10/2009**	
	Preamp	**Brüel & Kjær**	**ZC 0032**	**4265**	**9/10/2009**	
	Calibrator	**Brüel & Kjær**	**4231**	**2545667**	**9/10/2009**	

Weather Data			
Est.	**Duration:** 10 minutes		**Sky:** ☼
	Note: dBA Offset = -0.02		**Sensor Height (ft):** 5 ft
	Wind Ave Speed (mph / m/s)	**Temperature (degrees Fahrenheit)**	**Barometer Pressure (hPa)**
	1.0	79.6	1019.0

Photo of Measurement Location

2250

Instrument:		2250
Application:		BZ7225 Version 2.0.2
Start Time:		11/05/2009 12:35:34
End Time:		11/05/2009 12:45:34
Elapsed Time:		00:10:00
Bandwidth:		1/3-octave
Max Input Level:		140.16

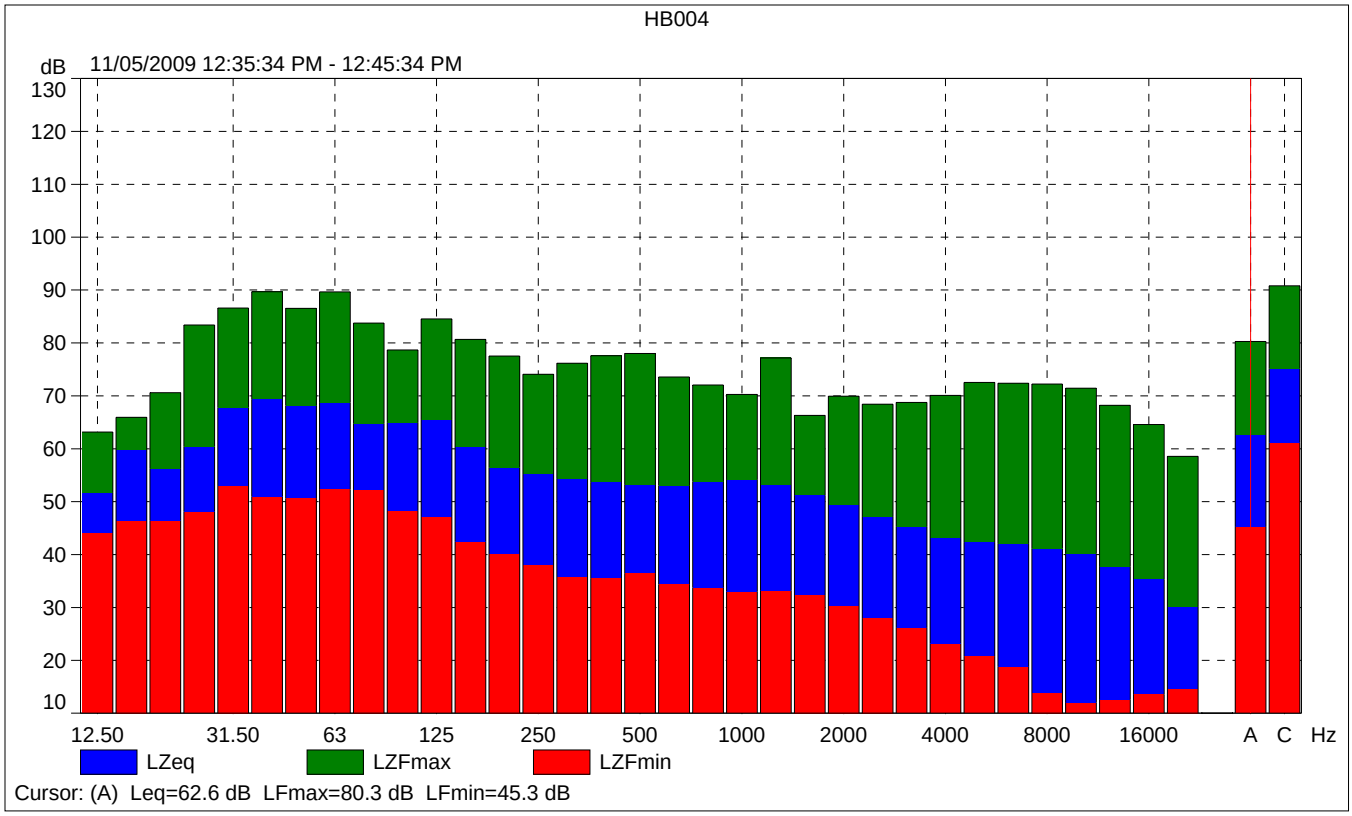
	Time	Frequency
Broadband (excl. Peak):	FSI	AC
Broadband Peak:		C
Spectrum:	FS	Z

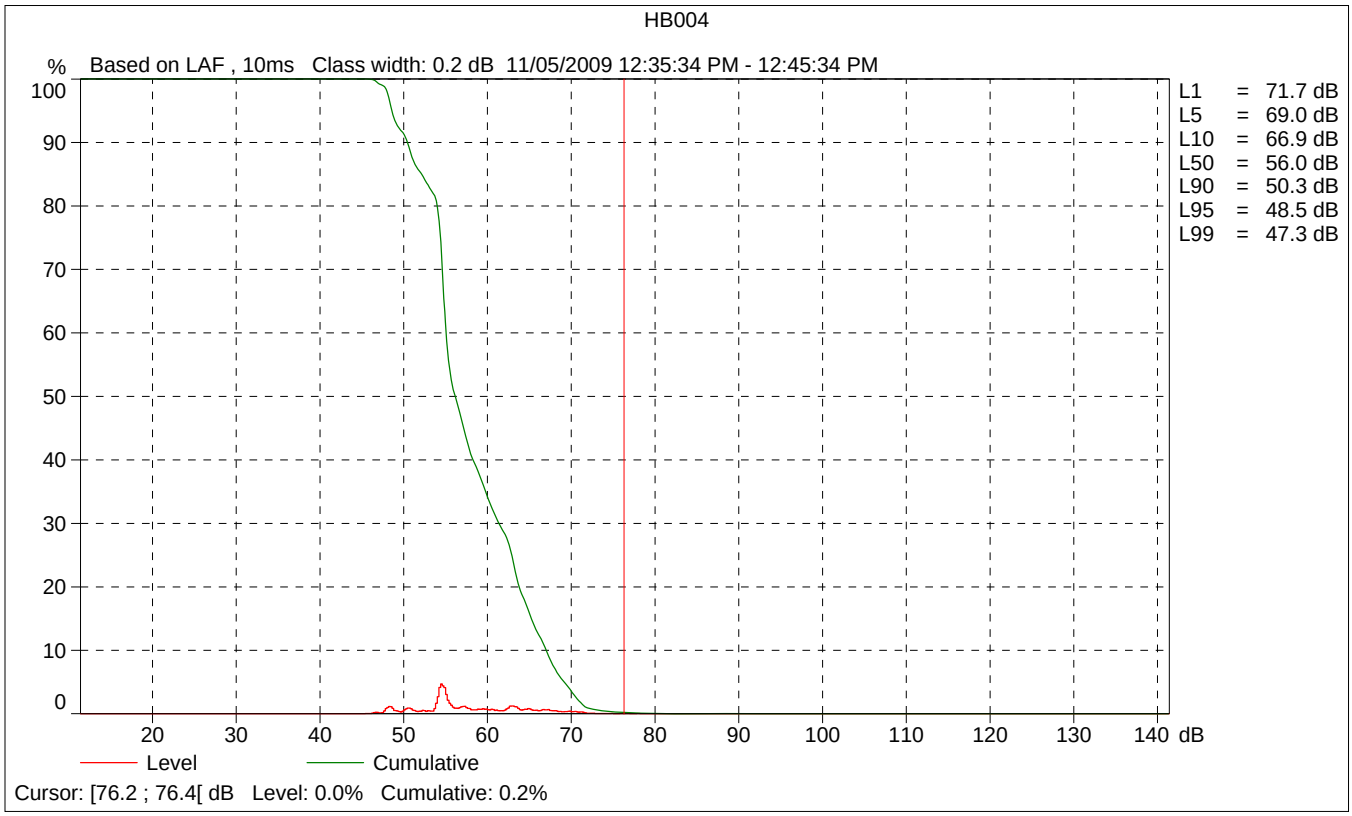
Instrument Serial Number:		2548189
Microphone Serial Number:		2543364
Input:		Top Socket
Windscreen Correction:		None
Sound Field Correction:		Diffuse-field

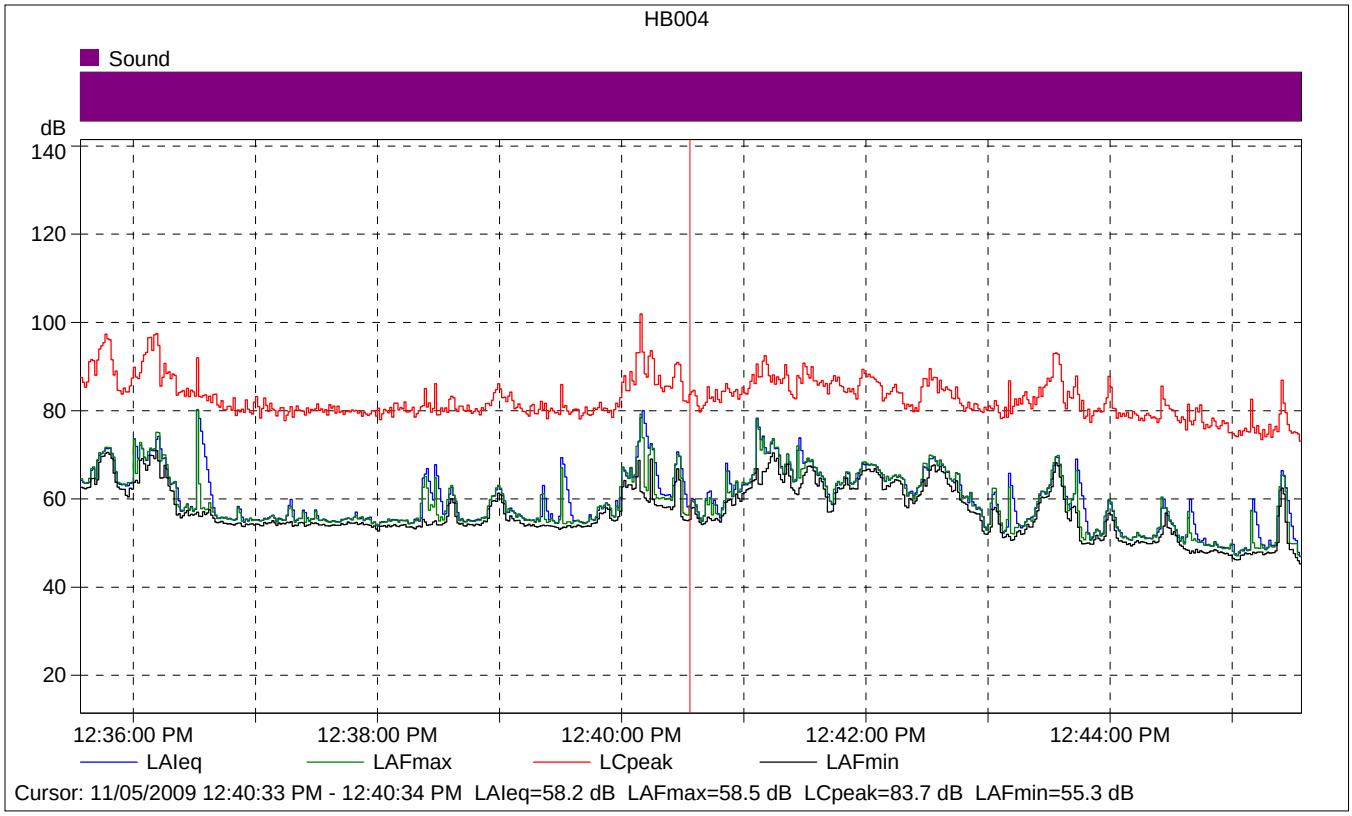
Calibration Time:		11/04/2009 17:46:40
Calibration Type:		External reference
Sensitivity:		54.69 mV/Pa

HB004

	Start time	End time	Elapsed time	Overload [%]	LAeq [dB]	LAFmax [dB]	LAFmin [dB]
Value				0.00	62.6	80.3	45.3
Time	12:35:34 PM	12:45:34 PM	0:10:00				
Date	11/05/2009	11/05/2009					

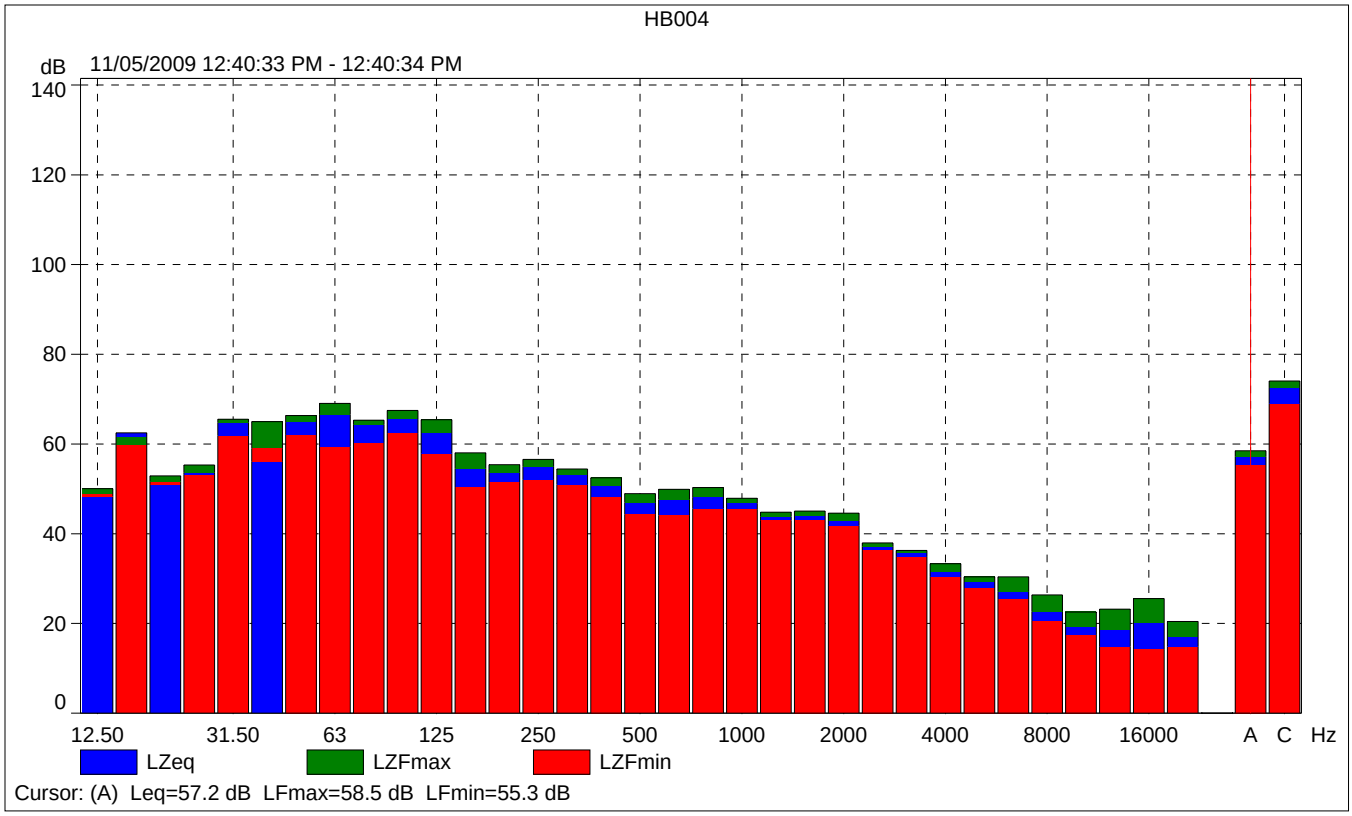

HB004
dB
11/05/2009 12:35:34 PM - 12:45:34 PM
130
120
110
100
90
80
70
60
50
40
30
20
10
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=62.6 dB LFmax=80.3 dB LFmin=45.3 dB

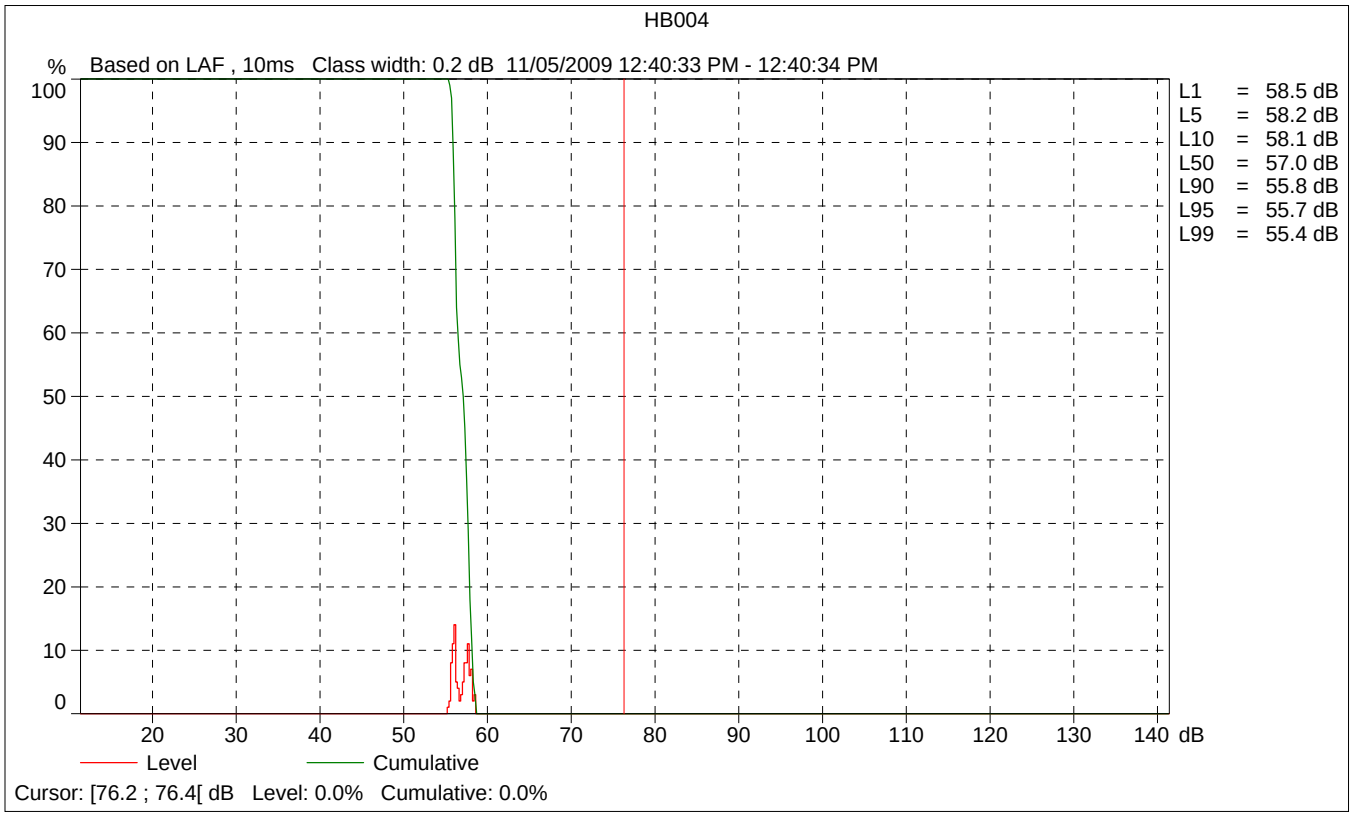

HB004
%
Based on LAF , 10ms Class width: 0.2 dB 11/05/2009 12:35:34 PM - 12:45:34 PM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 71.7 dB
L5 = 69.0 dB
L10 = 66.9 dB
L50 = 56.0 dB
L90 = 50.3 dB
L95 = 48.5 dB
L99 = 47.3 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.2%

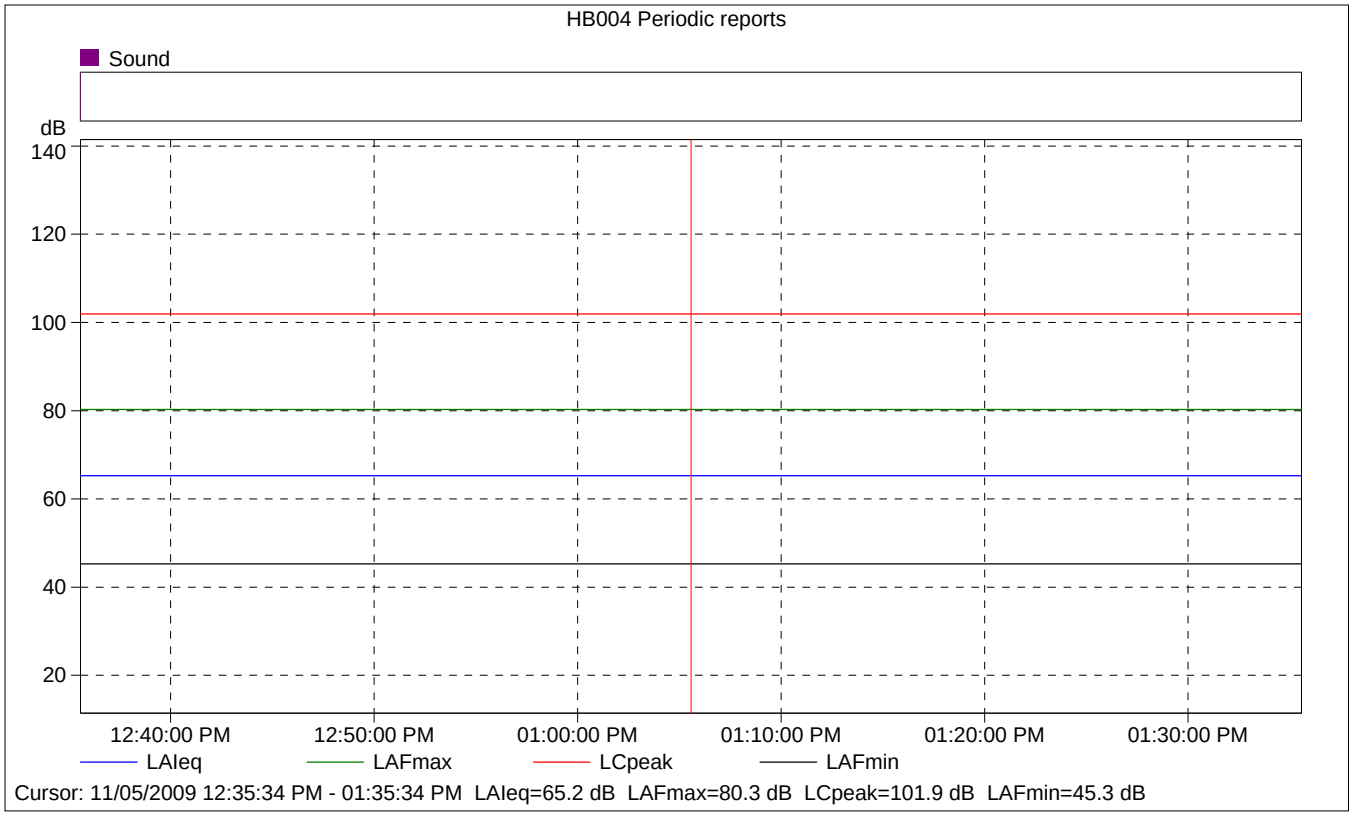


HB004

	Start time	Elapsed time	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			58.2	58.5	55.3
Time	12:40:33 PM	0:00:01			
Date	11/05/2009				

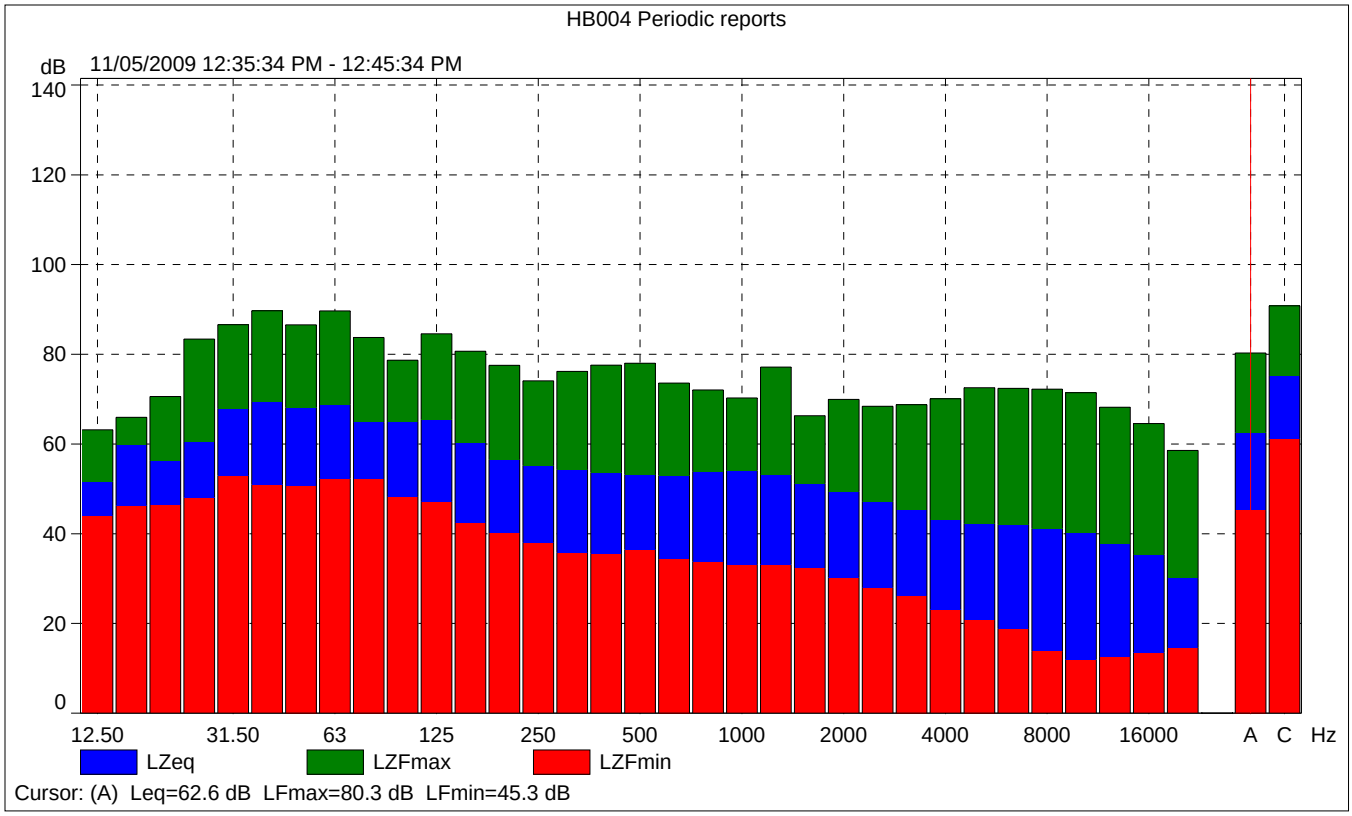

HB004
dB
11/05/2009 12:40:33 PM - 12:40:34 PM
140
120
100
80
60
40
20
0
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=57.2 dB LFmax=58.5 dB LFmin=55.3 dB

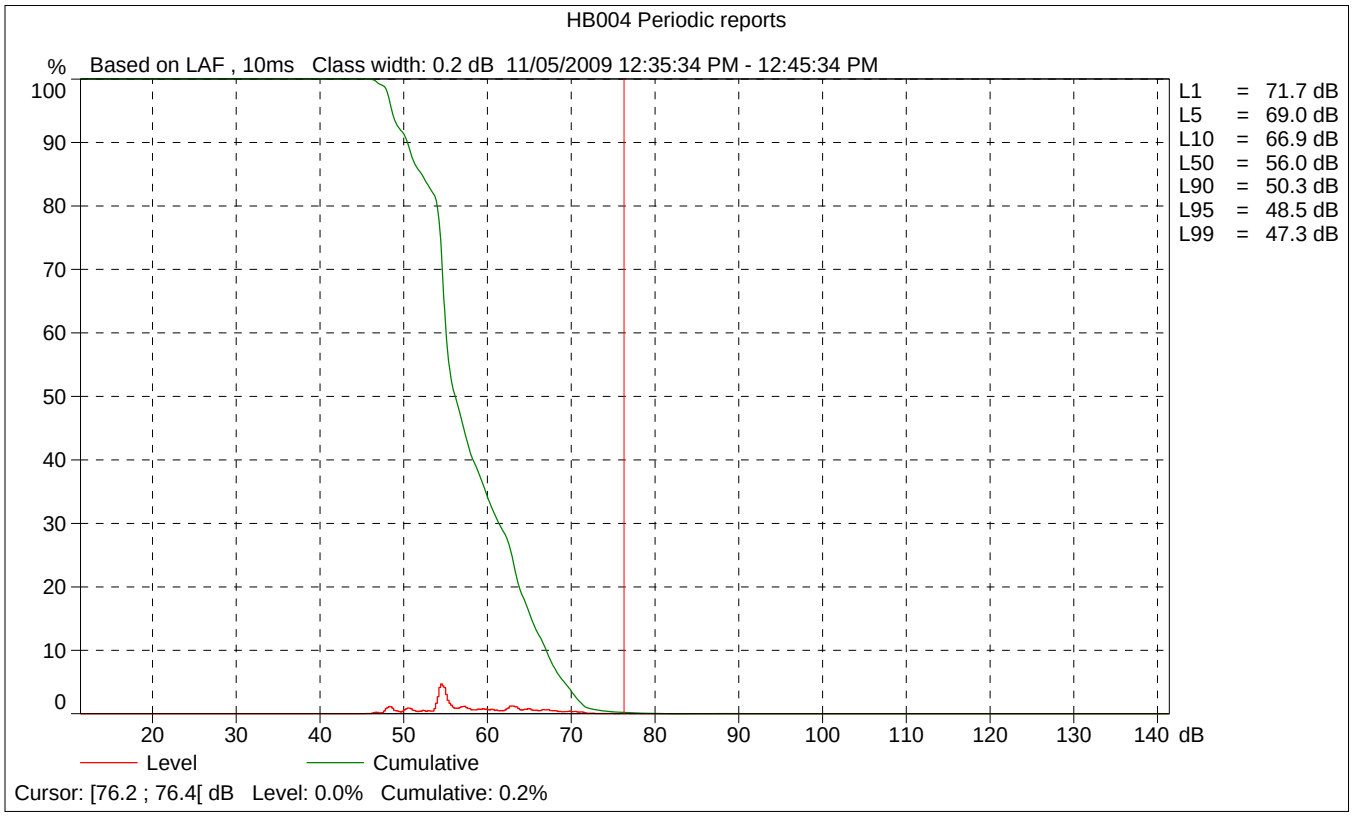

HB004
%
Based on LAF , 10ms Class width: 0.2 dB 11/05/2009 12:40:33 PM - 12:40:34 PM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140 dB
L1 = 58.5 dB
L5 = 58.2 dB
L10 = 58.1 dB
L50 = 57.0 dB
L90 = 55.8 dB
L95 = 55.7 dB
L99 = 55.4 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%

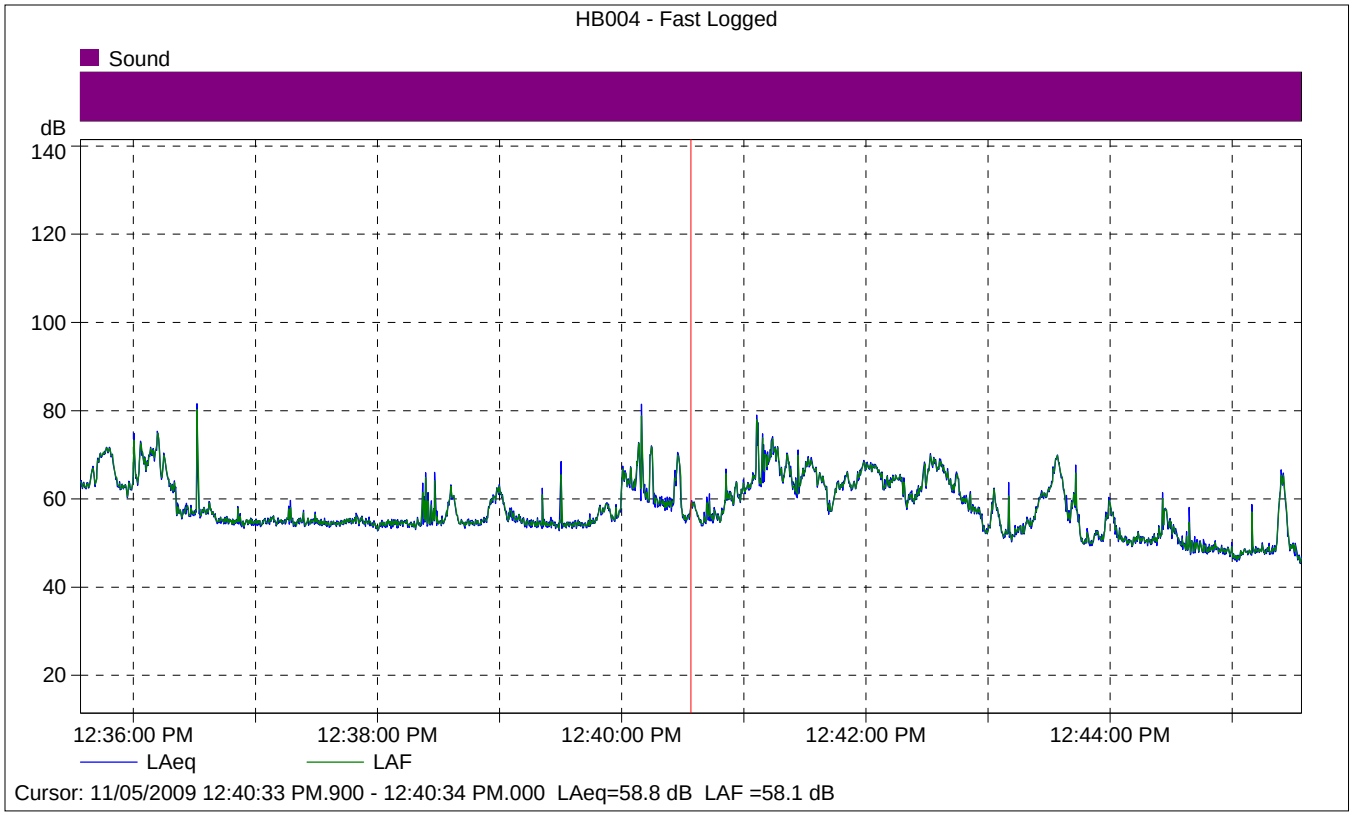


HB004 Periodic reports

	Start time	Elapsed time	Overload [%]	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			0.00	65.2	80.3	45.3
Time	12:35:34 PM	0:10:00				
Date	11/05/2009					


HB004 Periodic reports
dB
11/05/2009 12:35:34 PM - 12:45:34 PM
140
120
100
80
60
40
20
0
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=62.6 dB LFmax=80.3 dB LFmin=45.3 dB


HB004 Periodic reports
%
Based on LAF , 10ms Class width: 0.2 dB 11/05/2009 12:35:34 PM - 12:45:34 PM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 71.7 dB
L5 = 69.0 dB
L10 = 66.9 dB
L50 = 56.0 dB
L90 = 50.3 dB
L95 = 48.5 dB
L99 = 47.3 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.2%



HB004 - Fast Logged

	Start time	Elapsed time	LAeq [dB]
Value			58.8
Time	12:40:33 PM.900	0:00:00.100	
Date	11/05/2009		

Site Number: #5 (HB # 005)
Recorded By: Brian Allee
Job Number: 15102152
Date: 11/05/2009
Time: 11:57 AM
Location: Edison Community Park, adjacent to project site and mobile home park.
GPS:
Source of Peak Noise: Vehicular noise from Magnolia Street and Hamilton Avenue – Lots of traffic due to Edison Community Park, Community Center, and High School – Vehicular traffic in parking lot – Two planes flew over – Several pedestrians in park playing basketball/football/picnicking – Birds chirping.

Noise Data			
Leq (dB)	**Lmin (dB)**	**Lmax (dB)**	**Peak (dB)**
53.2	43.6	71.2	95.5

Equipment						
Category	**Type**	**Vendor**	**Model**	**Serial No.**	**Cert. Date**	**Note**
Sound	Sound Level Meter	**Brüel & Kjær**	**2250**	**2548189**	**9/10/2009**	
	Microphone	**Brüel & Kjær**	**4189**	**2543364**	**9/10/2009**	
	Preamp	**Brüel & Kjær**	**ZC 0032**	**4265**	**9/10/2009**	
	Calibrator	**Brüel & Kjær**	**4231**	**2545667**	**9/10/2009**	

Weather Data			
Est.	**Duration:** 10 minutes		**Sky:** ☼
	Note: dBA Offset = -0.02		**Sensor Height (ft):** 5 ft
	Wind Ave Speed (mph / m/s)	**Temperature (degrees Fahrenheit)**	**Barometer Pressure (hPa)**
	1.0	74.3	1019.1

Photo of Measurement Location

2250

Instrument:		2250
Application:		BZ7225 Version 2.0.2
Start Time:		11/05/2009 12:57:56
End Time:		11/05/2009 13:08:39
Elapsed Time:		00:10:00
Bandwidth:		1/3-octave
Max Input Level:		140.16

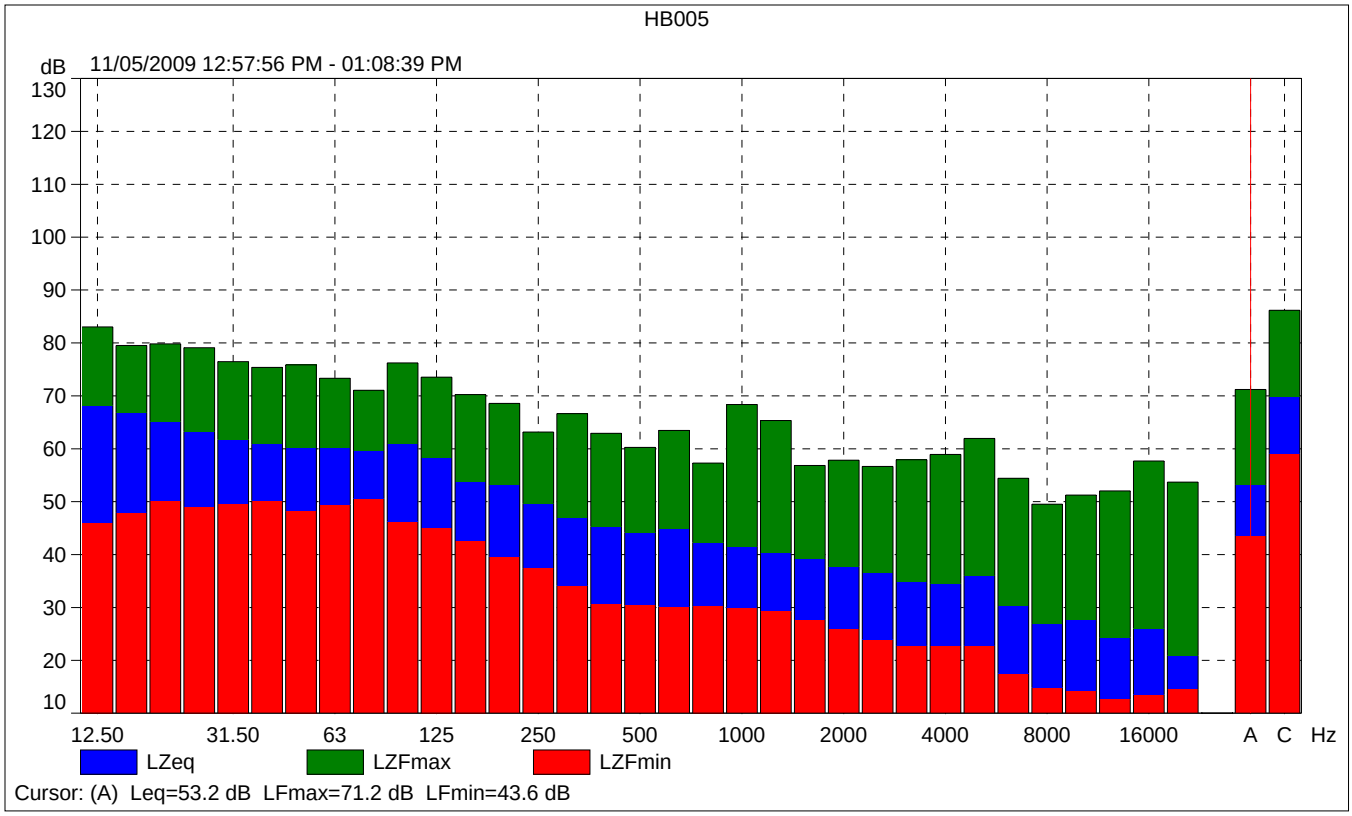
	Time	Frequency
Broadband (excl. Peak):	FSI	AC
Broadband Peak:		C
Spectrum:	FS	Z

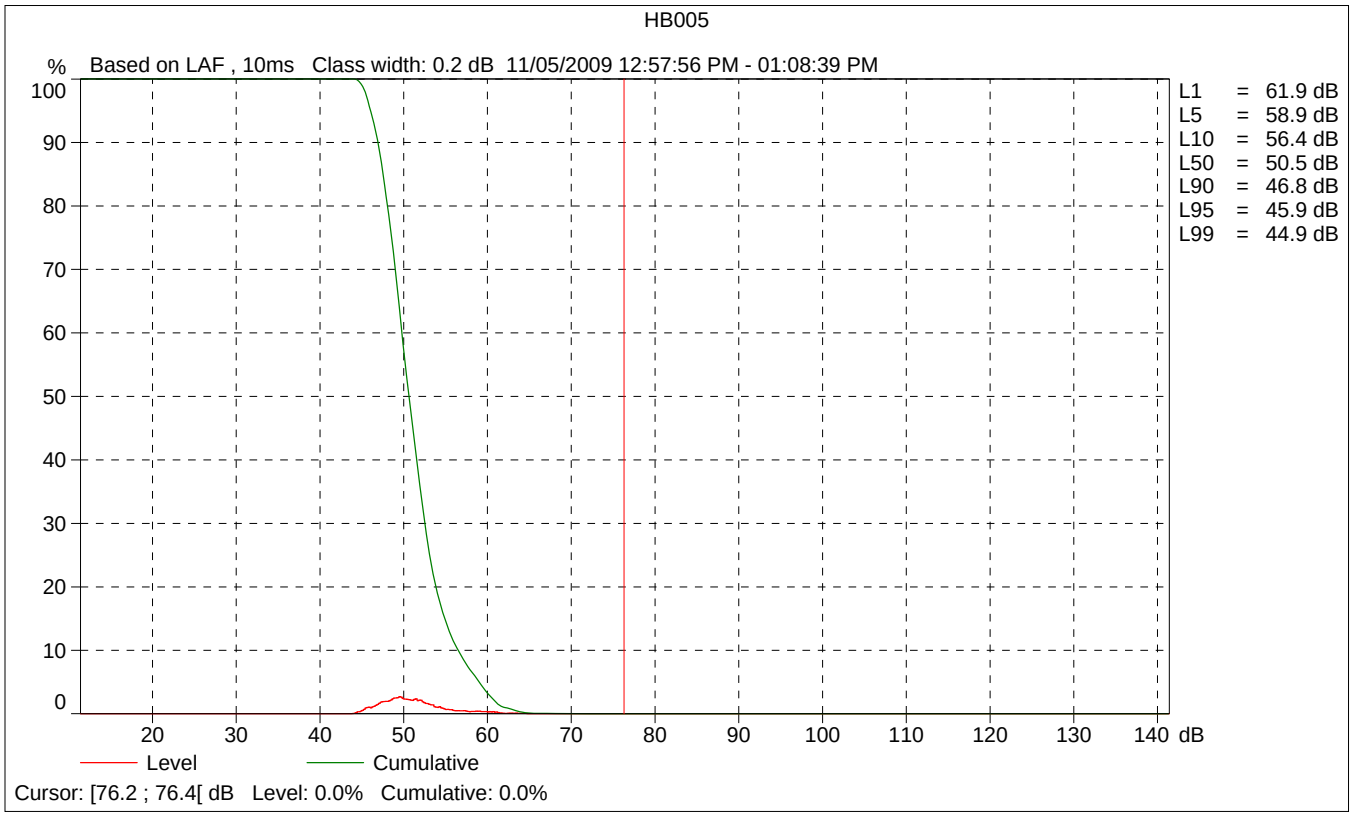
Instrument Serial Number:		2548189
Microphone Serial Number:		2543364
Input:		Top Socket
Windscreen Correction:		None
Sound Field Correction:		Diffuse-field

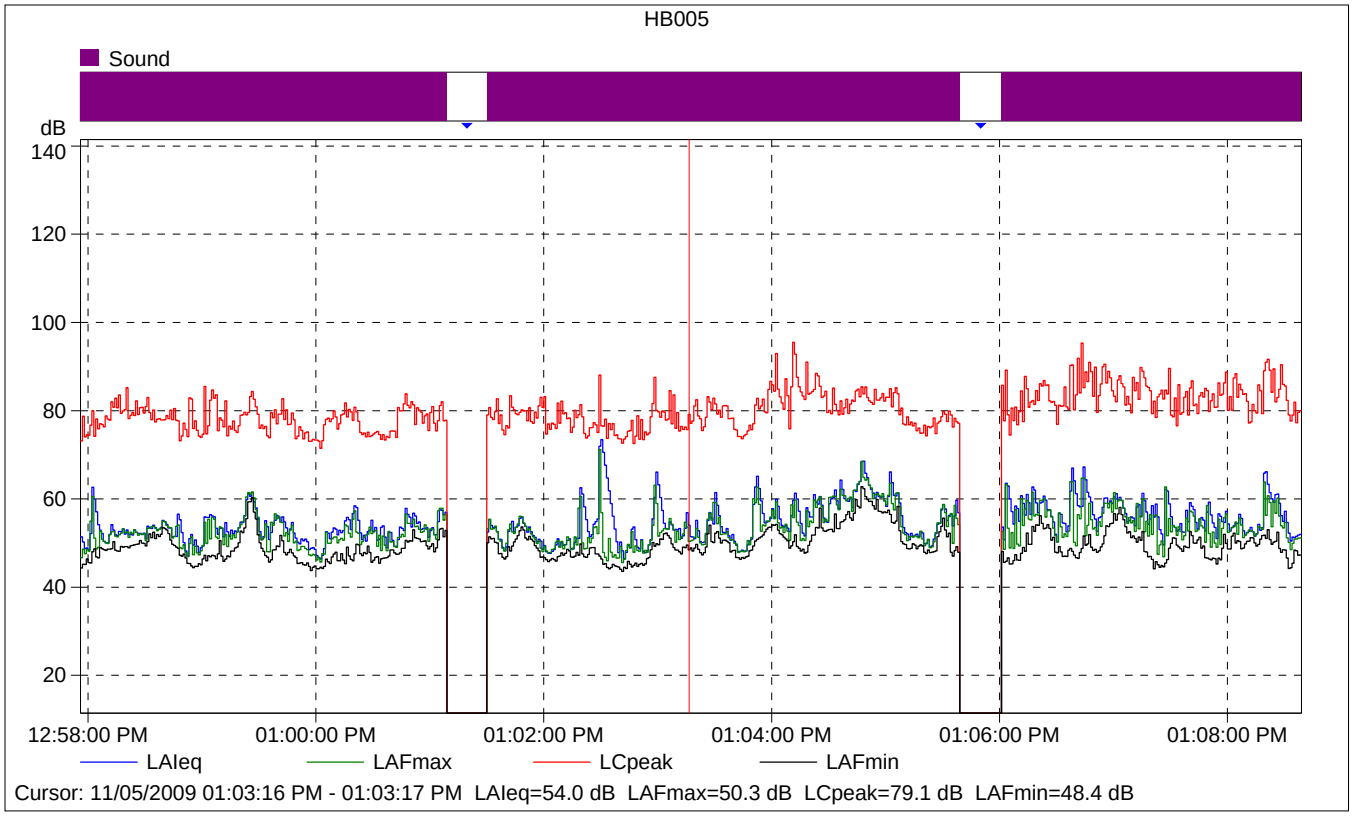
Calibration Time:		11/04/2009 17:46:40
Calibration Type:		External reference
Sensitivity:		54.69 mV/Pa

HB005

	Start time	End time	Elapsed time	Overload [%]	LAeq [dB]	LAFmax [dB]	LAFmin [dB]
Value				0.00	53.2	71.2	43.6
Time	12:57:56 PM	01:08:39 PM	0:10:00				
Date	11/05/2009	11/05/2009					

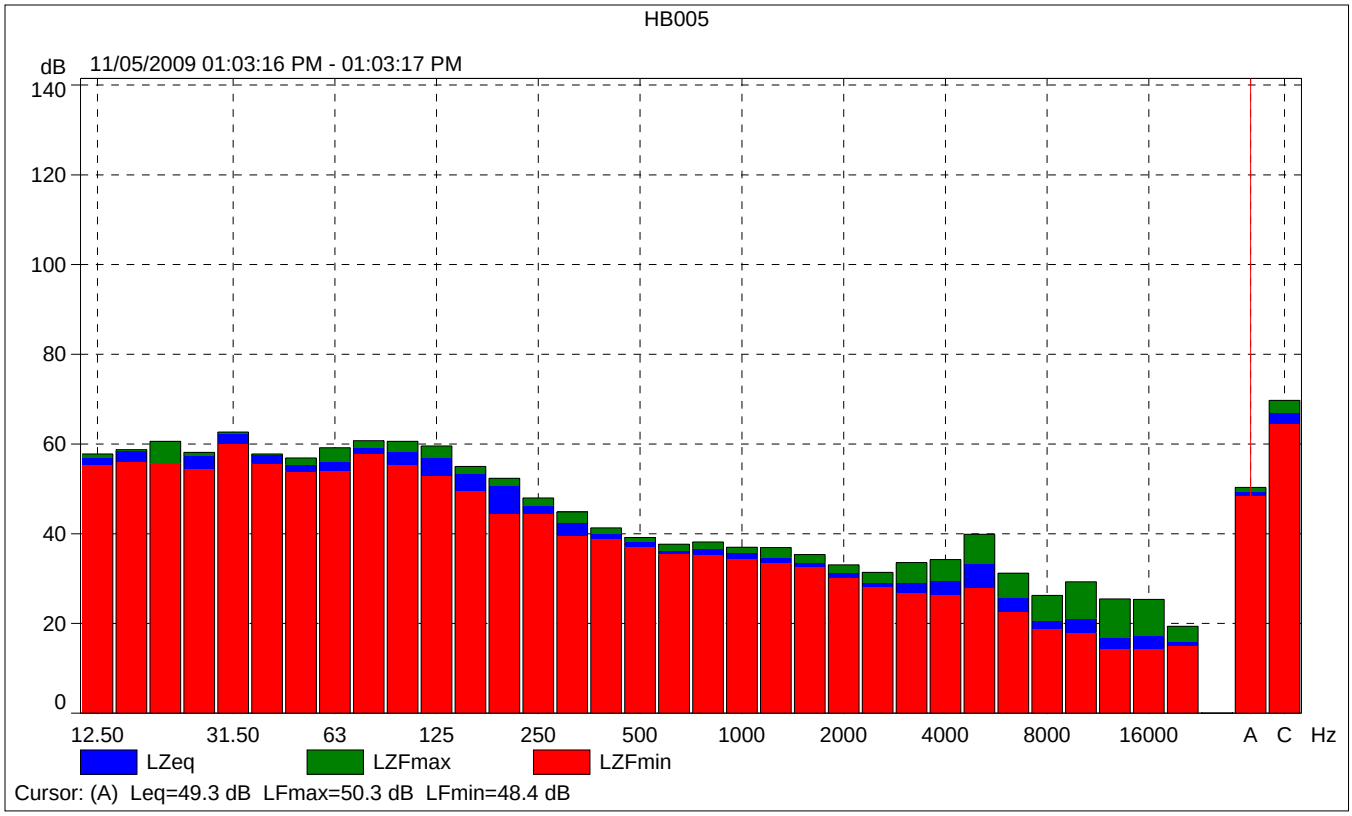

HB005
dB
11/05/2009 12:57:56 PM - 01:08:39 PM
130
120
110
100
90
80
70
60
50
40
30
20
10
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=53.2 dB LFmax=71.2 dB LFmin=43.6 dB

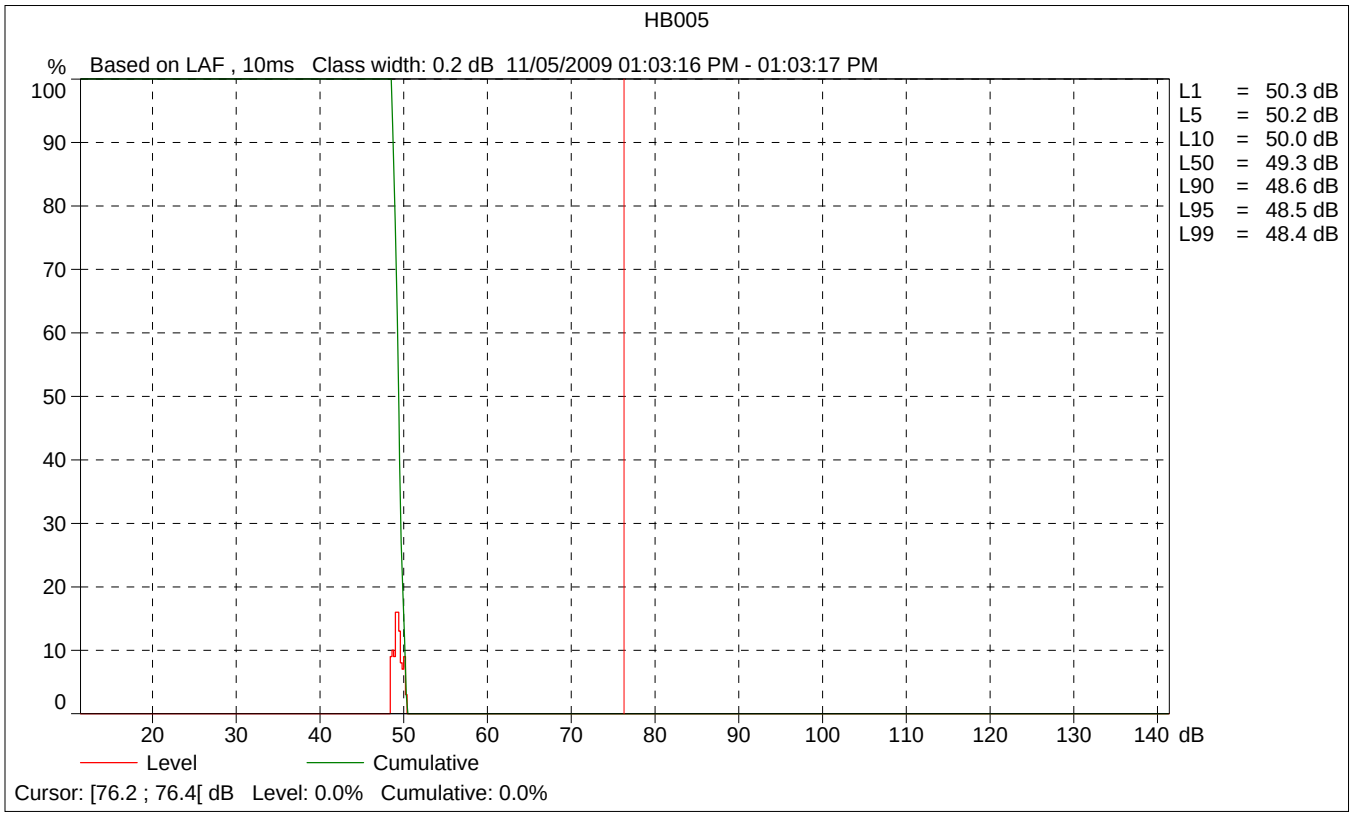

HB005
%
Based on LAF , 10ms Class width: 0.2 dB 11/05/2009 12:57:56 PM - 01:08:39 PM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 61.9 dB
L5 = 58.9 dB
L10 = 56.4 dB
L50 = 50.5 dB
L90 = 46.8 dB
L95 = 45.9 dB
L99 = 44.9 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%

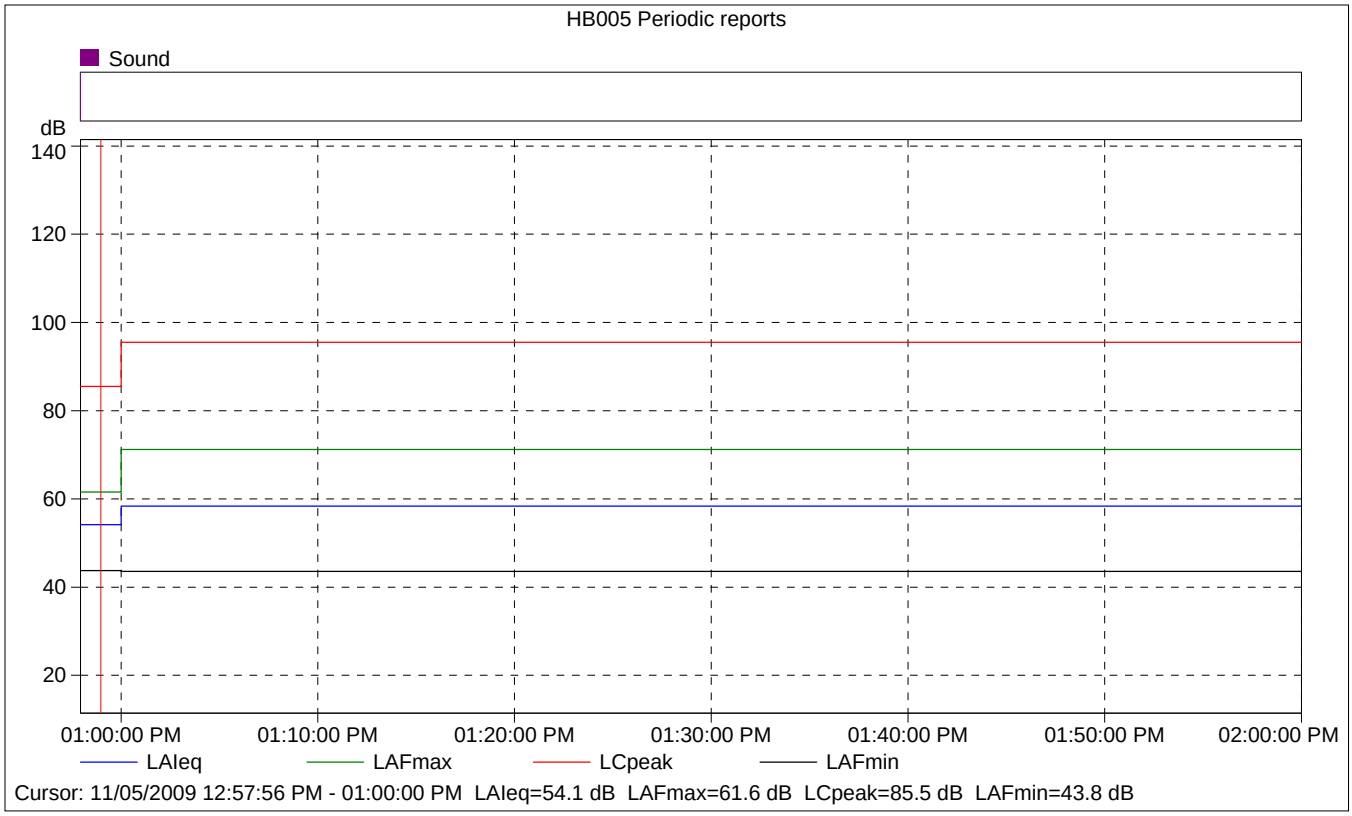


HB005

	Start time	Elapsed time	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			54.0	50.3	48.4
Time	01:03:16 PM	0:00:01			
Date	11/05/2009				

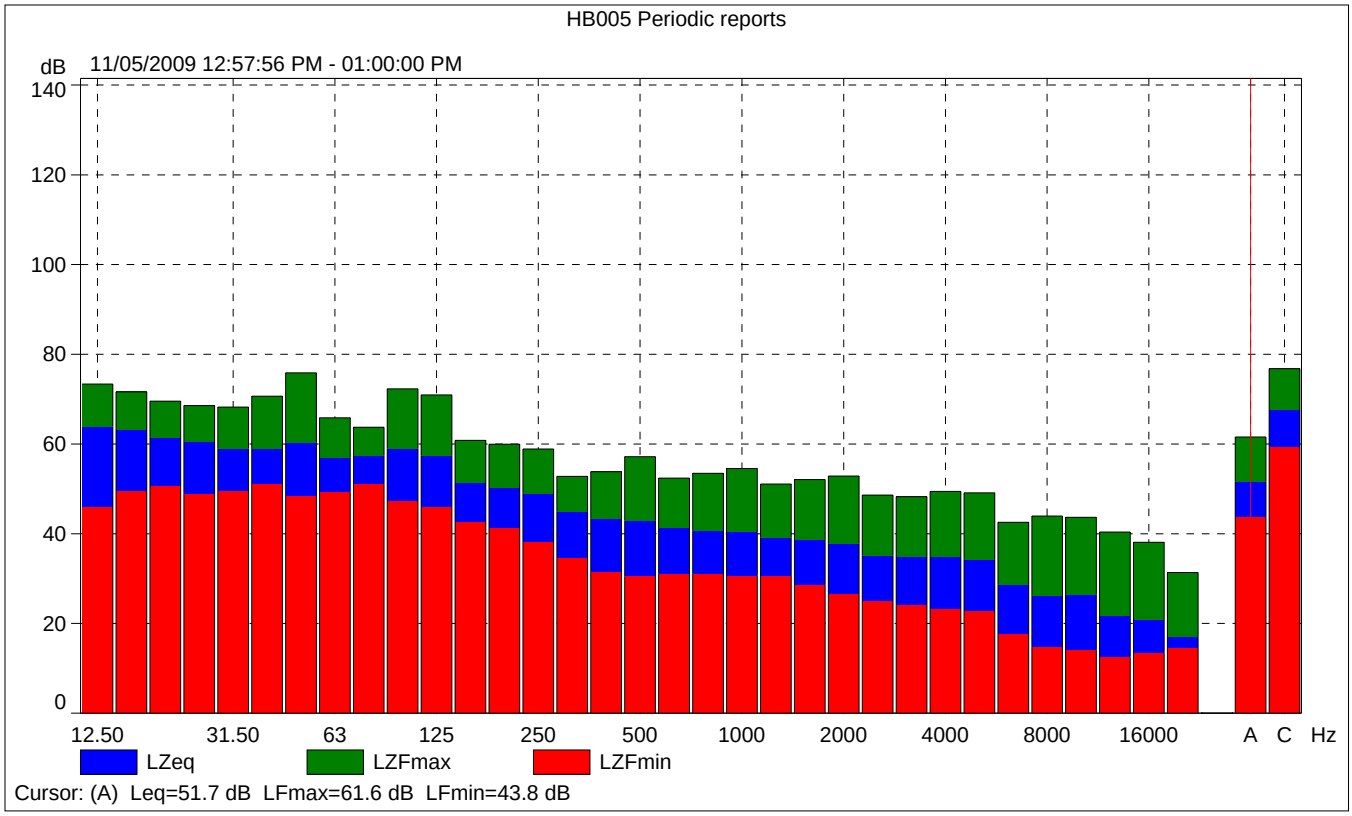

HB005
dB
11/05/2009 01:03:16 PM - 01:03:17 PM
140
120
100
80
60
40
20
0
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=49.3 dB LFmax=50.3 dB LFmin=48.4 dB

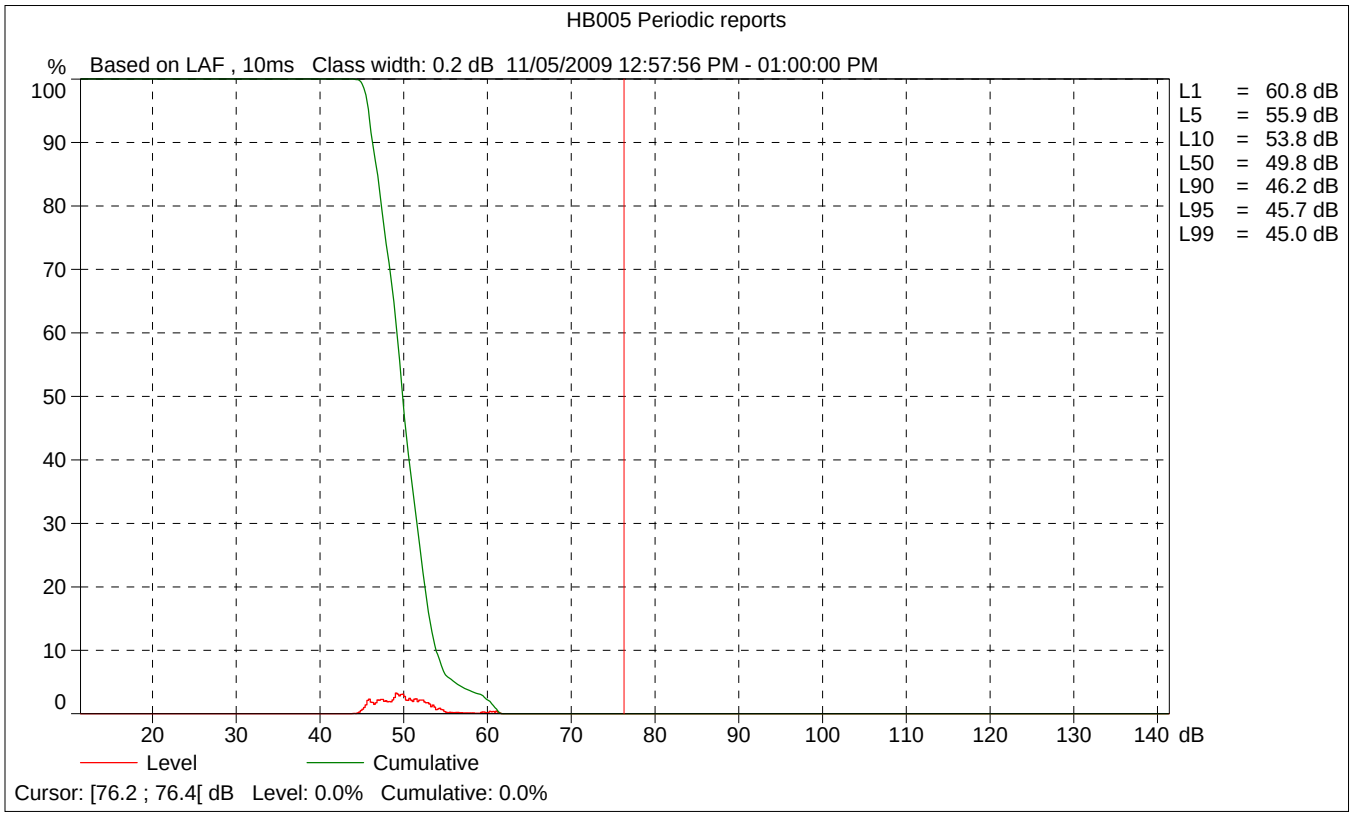

HB005
%
Based on LAF , 10ms Class width: 0.2 dB 11/05/2009 01:03:16 PM - 01:03:17 PM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140 dB
L1 = 50.3 dB
L5 = 50.2 dB
L10 = 50.0 dB
L50 = 49.3 dB
L90 = 48.6 dB
L95 = 48.5 dB
L99 = 48.4 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%

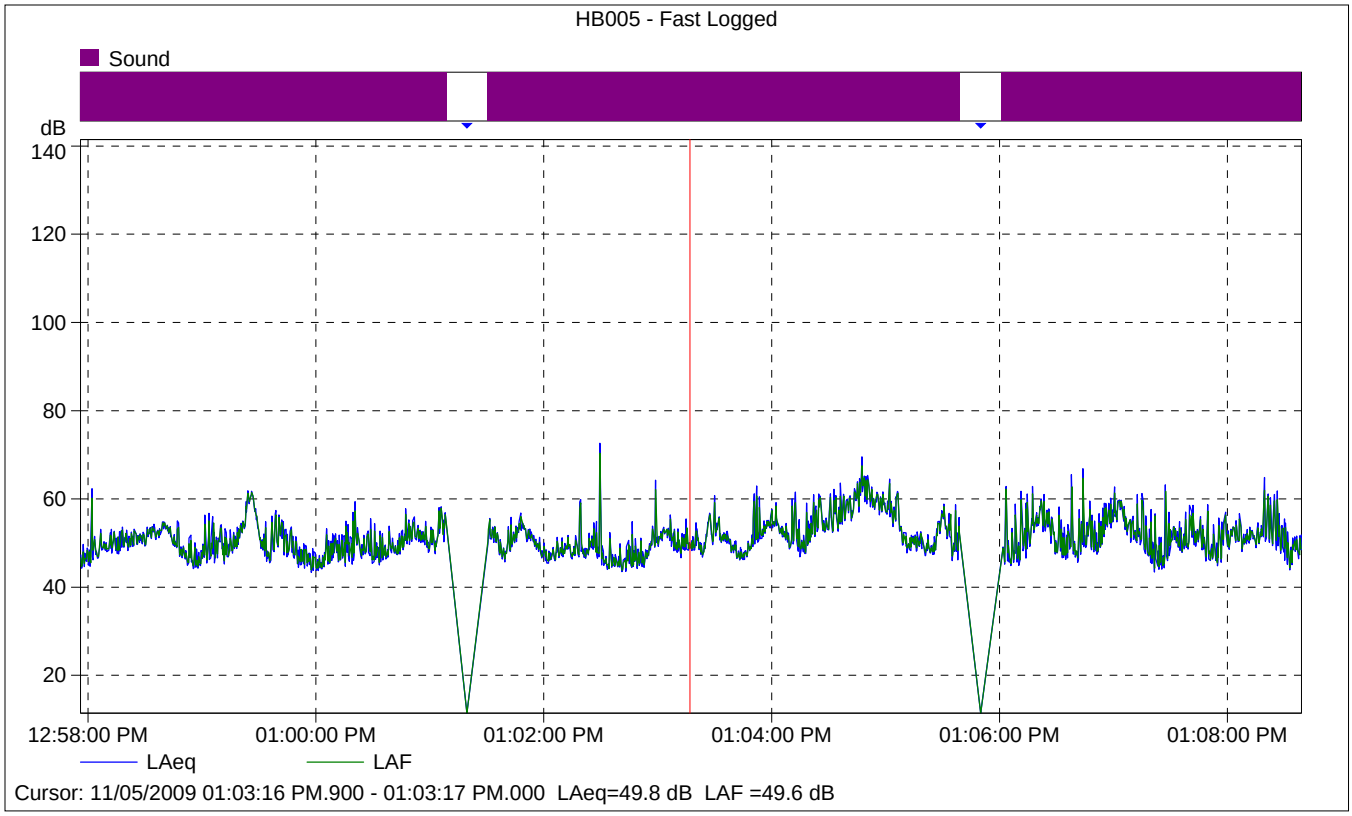


HB005 Periodic reports

	Start time	Elapsed time	Overload [%]	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			0.00	54.1	61.6	43.8
Time	12:57:56 PM	0:02:04				
Date	11/05/2009					


HB005 Periodic reports
dB
11/05/2009 12:57:56 PM - 01:00:00 PM
140
120
100
80
60
40
20
0
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=51.7 dB LFmax=61.6 dB LFmin=43.8 dB


HB005 Periodic reports
%
Based on LAF , 10ms Class width: 0.2 dB 11/05/2009 12:57:56 PM - 01:00:00 PM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 60.8 dB
L5 = 55.9 dB
L10 = 53.8 dB
L50 = 49.8 dB
L90 = 46.2 dB
L95 = 45.7 dB
L99 = 45.0 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%



HB005 - Fast Logged

	Start time	Elapsed time	LAeq [dB]
Value			49.8
Time	01:03:16 PM.900	0:00:00.100	
Date	11/05/2009		

Roadway Construction Noise Model (RCNM),Version 1.0

Report date 11/18/2009
Case Desc Demolition

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
North	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	925	0
Tractor	No	40	84		925	0
Concrete Saw	No	20		89.6	925	0
Dozer	No	40		81.7	925	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	52.2	48.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	58.7	54.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Saw	64.2	57.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	56.3	52.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	64.2	60.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
East	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	1525	0
Tractor	No	40	84		1525	0
Concrete Saw	No	20		89.6	1525	0
Dozer	No	40		81.7	1525	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	47.9	43.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	54.3	50.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Saw	59.9	52.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	52	48	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	59.9	55.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
West	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	285	0
Tractor	No	40	84		285	0
Concrete Saw	No	20		89.6	285	0
Dozer	No	40		81.7	285	0

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	62.4	58.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	68.9	64.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Saw	74.5	67.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	66.6	62.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	74.5	70.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.0

Report date ########
Case Desc Grading

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
North	Residentia	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85		925	0
Flat Bed Truck	No	40		74.3	925	0
Backhoe	No	40		77.6	925	0
Dozer	No	40		81.7	925	0

Results

Equipment	Calculated (dBA) *Lmax	Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
			Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
Grader	59.7	55.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	48.9	44.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	52.2	48.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	56.3	52.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	59.7	58.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
East	Residentia	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85		1525	0
Flat Bed Truck	No	40		74.3	1525	0
Backhoe	No	40		77.6	1525	0
Dozer	No	40		81.7	1525	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Grader	55.3	51.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	44.6	40.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	47.9	43.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	52	48	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	55.3	53.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
West	Residentia	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85		285	0
Flat Bed Truck	No	40		74.3	285	0
Backhoe	No	40		77.6	285	0
Dozer	No	40		81.7	285	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Grader	69.9	65.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	59.1	55.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	62.4	58.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	66.6	62.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	69.9	68.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.0

Report date: 11/18/2009
Case Description: Trenching

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
North	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	925	0
Excavator	No	40		80.7	925	0
All Other Equipment > 5 HP	No	50	85		925	0

Equipment	Results Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq	Noise Limit Exceedance (dB) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax
Excavator	55.4	51.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	55.4	51.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	59.7	56.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	59.7	58.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
East	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	1525	0
Excavator	No	40		80.7	1525	0
All Other Equipment > 5 HP	No	50	85		1525	0

Results

Equipment	Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq	Day Lmax	Leq	Noise Limit Exceedance (dB Evening Lmax	Leq	Night Lmax
Excavator	51	47	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	51	47	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	55.3	52.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	55.3	54.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
West	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	285	0
Excavator	No	40		80.7	285	0
All Other Equipment > 5 HP	No	50	85		285	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dB				
			Day		Evening		Night		Day		Evening		Night
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Excavator	65.6	61.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	65.6	61.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	69.9	66.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	69.9	68.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

A)

Leq
N/A
N/A
N/A
N/A

3A)

Leq
N/A
N/A
N/A
N/A

A)

Leq
N/A
N/A
N/A
N/A

Roadway Construction Noise Model (RCNM),Version 1.0

Report date 11/18/2009
Case Desc Paving

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
North	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Mixer Truck	No	40		78.8	925	0
Concrete Mixer Truck	No	40		78.8	925	0
Concrete Mixer Truck	No	40		78.8	925	0
Concrete Mixer Truck	No	40		78.8	925	0
Pavement Scarafier	No	20		89.5	925	0
Pavement Scarafier	No	20		89.5	925	0
Paver	No	50		77.2	925	0
Roller	No	20		80	925	0
Tractor	No	40	84		925	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Concrete Mixer Truck	53.5	49.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Mixer Truck	53.5	49.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Mixer Truck	53.5	49.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Mixer Truck	53.5	49.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pavement Scarafier	64.2	57.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pavement Scarafier	64.2	57.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	51.9	48.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	54.7	47.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	58.7	54.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	64.2	62.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
East	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Mixer Truck	No	40		78.8	1525	0
Concrete Mixer Truck	No	40		78.8	1525	0
Concrete Mixer Truck	No	40		78.8	1525	0
Concrete Mixer Truck	No	40		78.8	1525	0
Pavement Scarafier	No	20		89.5	1525	0
Pavement Scarafier	No	20		89.5	1525	0
Paver	No	50		77.2	1525	0
Roller	No	20		80	1525	0
Tractor	No	40	84		1525	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Concrete Mixer Truck	49.1	45.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Mixer Truck	49.1	45.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Mixer Truck	49.1	45.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Mixer Truck	49.1	45.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pavement Scarafier	59.8	52.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pavement Scarafier	59.8	52.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	47.5	44.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	50.3	43.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	54.3	50.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	59.8	58.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
West	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Mixer Truck	No	40		78.8	285	0
Concrete Mixer Truck	No	40		78.8	285	0
Concrete Mixer Truck	No	40		78.8	285	0
Concrete Mixer Truck	No	40		78.8	285	0
Pavement Scarafier	No	20		89.5	285	0
Pavement Scarafier	No	20		89.5	285	0
Paver	No	50		77.2	285	0
Roller	No	20		80	285	0
Tractor	No	40	84		285	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Concrete Mixer Truck	63.7	59.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Mixer Truck	63.7	59.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Mixer Truck	63.7	59.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Mixer Truck	63.7	59.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pavement Scarafier	74.4	67.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pavement Scarafier	74.4	67.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	62.1	59.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	64.9	57.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	68.9	64.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	74.4	72.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.0

Report date 11/18/2009
Case Desc Construction

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
North	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	925	0
All Other Equipment > 5 H	No	50	85		925	0
All Other Equipment > 5 H	No	50	85		925	0
Tractor	No	40	84		925	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane	55.2	47.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 H	59.7	56.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 H	59.7	56.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	58.7	54.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	59.7	61	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
East	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	1525	0
All Other Equipment > 5 H	No	50	85		1525	0
All Other Equipment > 5 H	No	50	85		1525	0
Tractor	No	40	84		1525	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane	50.9	42.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 H	55.3	52.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 H	55.3	52.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	54.3	50.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	55.3	56.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
West	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	990	0
All Other Equipment > 5 H	No	50	85		990	0
All Other Equipment > 5 H	No	50	85		990	0
Tractor	No	40	84		285	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane	54.6	46.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 H	59.1	56.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 H	59.1	56.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	68.9	64.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	68.9	66	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.